AMERICAN RED CROSS TEXT BOOK ON ELEMENTARY HYGIENE AND HOME CARE OF THE SICK



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DELANO AND McISAAC



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AMERICAN RED CROSS TEXTBOOK

ON

ELEMENTARY HYGIENE

AND

HOME CARE OF THE SICK

BY

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PREFACE

One of the most significant facts in the march of human progress during the last decade is the great awakening of public interest in the questions of health. Work as hard as they might, neither the medical nor nursing professions could alone accomplish much along sanitary lines until the people in general became aroused to the importance of such matters. Knowledge that personal health depends largely upon the health conditions of the community brings home to each individual a serious personal interest and sense of responsibility.

In the Red Cross First Aid textbooks, not a little space is devoted to instructions for the prevention of accidents. In the textbook herewith presented, a reference to the topics of the lessons will reveal the fact that half of the book is given up to such practical subjects as lead to the prevention of disease. This study of elementary hygiene in connection with the person, the household and the community, shows that in the estimation of its authors, prevention is of the first and utmost importance.

But in spite of the strongest barriers yet devised, disease cannot always be kept out. To the gentle hands of woman belongs the care of the sick, and every woman should realize that the time may come when such a care will be hers. This does not mean she should fit herself for professional service by long years of hard study in hospital training schools, but it does mean she should learn the simple and valuable lessons this book can teach her for the care of the sick in her own home.

As a great humane and patriotic institution devoted to the mitigation of suffering for the sake of humanity and the upbuilding of a strong and vigorous people, the American Red Cross heartily recommends to all women the practical and helpful knowledge to be gained from this book.

MABEL T. BOARDMAN,
Chairman, National Relief Board,
American Red Cross

ACKNOWLEDGMENT

We have been greatly assisted by many friends and colleagues in the planning and preparation of this little book, and to all we beg to express our cordial thanks.

We are particularly indebted to Miss Isabel Stewart, R. N., Instructor, Department of Nursing and Health, Teachers College, New York, for her advice and generous help; and to Dr. H. W. Rucker, Assistant Surgeon General, U. S. Public Health Service, for his assistance in revising our manuscript.

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JANE A. DELANO.
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WASHINGTON, D. C.

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INTRODUCTION

Of all the factors which affect the welfare and happiness of the human race probably none is so important as good health; without a vigorous body, man's efficiency, comfort and happiness are disturbed or destroyed altogether. The earliest recorded history, notably the Old Testament, contains references to the diseases which afflicted men, theories as to their causes and suggestions for their prevention and relief; and from those days until ours, thoughtful men have devoted their lives to the same subjects.

In the Biblical time a patient was described as being "possessed of the devil" when his poor body suffered from those unseen forces, some of which even to this day defy the greatest scientists to reveal. Theories of the most absurd and grotesque character prevailed and still find lodgment in unintelligent minds as to the causes of disease, and it has only been slowly step by step that the mysterious causes have been brought to light by the studious men who have never failed in any generation to carry on the researches begun by their predecessors, nor to add something to the sum of scientific knowledge.

During the nineteenth century an almost complete revolution of all former theories occurred, when the discovery was made that many diseases were due to certain microscopic organisms, whose existence had long been recognized, but whose purpose had not been understood. Certain of these organisms were also found to be of vital importance in many familiar processes going on about us, such as fermentation, putrefaction, and some of the changes in plant life. Doubtless the benefits which accrue to man from their activities are greater than the harm done by the species which are found to be the cause of disease.

Because these microscopic organisms are so closely related to nearly all that pertains to health and disease, and particularly to the routine habits of our daily lives, it seems necessary for every one to have some understanding of their origin, development and, in the case of the germs of disease, of their danger. With this in view these notes on bacteria and the transmission of disease which have become common knowledge are given. The serious study of bacteriology will never go on far outside the laboratory of the scientist, but intelligent men and women can not fail to be interested in the manifestations of unseen life, which may seriously affect their own welfare.

Many years ago Florence Nightingale said that

"nearly every woman at some time in her life is obliged to act in the capacity of a nurse to the sick," and she might have added, that nearly all women at some time in their lives are obliged to be responsible in a great measure for the continued good health of the well. The latter fact has only recently been fully realized and out of it has grown the demand for instruction of women and girls which will better enable them to prevent the conditions in their own homes which undermine the health of their families.

The maintenance of the sanitary condition of houses and hospitals lies in the hands of women to a great extent, and particularly with nurses, mothers, housekeepers and teachers; and this being the case, a working knowledge of bacteriology is a necessity for all women who are in any way responsible for the living conditions and the health of human beings.

Nursing is not alone caring for the sick, the *prevention of infection* often constitutes as important a duty as the actual care of the patient. A woman who is without knowledge of the principles which should guide the performance of her work holds in her hands a capacity for doing infinite harm; she cannot avoid dangers which she does not recognize. This knowledge is necessary not only in the care of the sick but for her guidance in simple housekeep-

ing details. She must know why food supplies should be protected from dust and insects, and perishable foods kept at a low temperature; why the water supply must be pure; why sinks, drains, dishes, cooking utensils, household and body linen should be kept as clean as soap, water, sunshine and fresh air intelligently applied can make them. She must know why and when sick-room utensils need disinfection as well as soap and water scrubbing; why certain dishes are to be separated from others; why in certain cases bed and body linen and excreta must be disinfected. A good nursing technique is not acquired in one lesson nor in one year, but like the musician's technique requires years of daily practice coupled with intelligence and a good conscience. A slack, unintelligent method which slips over what "does not show" is as dangerous as fire in the hands of a child, and for this reason the care of the seriously sick patient should never be intrusted to the inexperienced.

Sedgwick, in his great work, Principles of Sanitary Science and Public Health, defines hygiene as follows: "*Hygiene* (*general hygiene*) *is the whole science and art of the conservation and promotion of health both in individuals and in communities. It has for its function the prevention of premature death and the promotion of normal life, health and happiness both directly by conservation and reënforcement*

of organisms and groups of organisms, and indirectly by the elimination or amelioration of unfavorable environmental conditions both local and general." He further adds, "*The field of hygiene is immense, for it includes not only all of sanitary science and the sanitary arts, but a large part of physiology and even of biology as well. It includes not only questions of water supply and sewerage, but also of climatology, foods and feeding, clothing, heating, lighting, ventilation, vaccination, scavenging, the personal care of the body, work and overwork, sleep, rest, fatigue, exercise, play, sports, noise, crowding and over-crowding, and other subjects too numerous to mention but comprised in part under the heads of public hygiene and personal hygiene, municipal sanitation, school sanitation, household sanitation, offensive trades, unwholesome or dangerous trades, quarantine, etc.*"

It is hoped this little book may furnish some light upon these formidable subjects which lie so near to the lives of house-mothers, whose labors for untold ages have been obscured by the idea that little intelligence is required to keep house and care for a family. Gradually the great importance of these two tasks belonging to women is beginning to be understood and these few lessons are designed to aid such of them as are looking for help.

LESSON I

BACTERIA AND THEIR RELATION TO HEALTH AND DISEASE

SUGGESTIONS FOR DEMONSTRATION

1. Show several common bacteria in the microscope.
2. Show water from the tap in the microscope.
3. Show test-tubes with bacterial growth.
4. Demonstrate how to clean a domestic filter.
5. Show food in glass jars which have been sterilized and properly sealed, also one which has been imperfectly sterilized or sealed, and shows mould or fermentation.

VOCABULARY

1. **Organism,** a living being, either animal or vegetable.
2. **Microörganism,** a minute or microscopic organism.
3. **Bacterium** (pl. bacteria), a minute vegetable organism, a microbe, a germ.
4. **Bacteriology,** concerned with the study of bacteria.
5. **Bactericide,** an agent which destroys bacteria.
6. **Saprophyte,** a microörganism which derives its food from decaying animal or vegetable matter.

7. **Parasite,** an organism which inhabits another organism.
8. **Protozoa,** the smallest form of animal life.
9. **Septic,** relating to the decomposition caused by bacteria.
10. **Aseptic,** free from bacteria or septic matter.
11. **Antiseptic,** having the power to destroy or arrest the growth of bacteria.
12. **Infection,** the communication of disease germs either directly or indirectly.
13. **Contagion** (*contagio*, to touch), the process by which special diseases are communicated between persons, either by direct contact or by means of an intermediate agent.
14. **Disinfectant,** an agent which destroys disease germs.
15. **Germicide,** an agent which destroys germs.
16. **Sterilization,** the complete destruction of all forms of microscopic life.
17. **Nitrogenous substances,** containing nitrogen, such as meat, eggs, fish, milk, beans, peas.

Bacteria are the smallest and simplest known form of plant life. The study of bacteria began with the development of the microscope; Leeuwenhoek, a Dutch lens-maker, in 1675 published the fact that he had perfected a lens of higher power than had hitherto been made, and described "ani-

malcules" (bacteria) which he had seen in water, in feces and in the tartar scraped from his teeth. While Leeuwenhoek made no attempt to suggest a theory as to the place which these organisms occupied in nature, the fact that they were found in the discharges from the human body led to the first association of bacteria and disease in the minds of medical scientists. The difficulties in methods of study were so great, however, that there was no way of classifying or separating the organisms, and it was not until Louis Pasteur, the great French chemist, began his researches into the processes of putrefaction and fermentation that bacteria were recognized as organisms whose activities were of such significance to the human race.

For two hundred years the theory of the place occupied by bacteria had been under discussion and Pasteur was the first man to prove theories by rigid experiments, which gave him the title of "the founder of bacteriology." It was Pasteur who proved that putrefaction is a chemical change produced by the activities of bacteria in their search for food; that the souring of milk is due to bacteria; and that certain bacteria are the cause of certain diseases.

The profound importance of Pasteur's work to the world is universally recognized. In 1892 Lord Lister said " * * * there does not exist any

individual to whom the medical sciences owe more than they do to Pasteur * * * ." Pasteur died in 1895.

Until 1882 the methods of study and observation of bacteria were so imperfect that only geniuses like Pasteur and Koch were able to make use of the new science, but as a result of a series of experiments by Koch and others, the uncertainties were largely removed and bacteriology placed upon a practical working basis which has revolutionized the whole practice of medicine, of agriculture and of many industries. The difficulty which beset the early investigators of bacteria was the presence of numberless kinds of germs together and the impossibility of separating a single species for observation. Bacteria were first grown artificially in beef bouillon, known as the culture medium, but the great number of kinds and the fluid medium effectually blocked the way to observation, until Robert Koch found that the addition of gelatin was not unfavorable to bacterial growth and would produce a solid transparent broth. Meanwhile it was found that to secure pure cultures of a single species all utensils, media or anything coming in contact with them must be freed of bacteria, *i. e.*, the articles must be sterilized or the cultures would not be pure. Later the discovery was made that by the use of aniline dyes the different kinds could

be identified, as each germ took the various colors in its own way, and from these beginnings the present-day elaborate technique of bacteriology developed.

Technique.—"The technique of bacteriology is one of its greatest contributions to both science and art, and the use of so valuable and simple a tool should be mastered, not only by the biological teacher but by both practical workers in medicine, hygiene and many other fields." (Jordan.)

STRUCTURE AND MODE OF DEVELOPMENT OF BACTERIA

Bacteria are the smallest and simplest known form of vegetable organisms. They have but one cell (unicellular) and multiply by splitting into equal parts (fission). The individual cells differ in size, shape and structure, which can be determined only by the microscope, but in masses of cells called colonies, which sometimes develop in suitable substances, they often present differences in form, color and consistency which may be detected with the naked eye.

Shape.—The forms of bacteria are exceedingly simple, comprising three types, the rod (bacillus), the sphere (coccus), and the spiral (spirillum). Long-continued growth in artificial media sometimes causes deformities in growth, just as un-

natural surroundings produce the same results in higher forms of life.

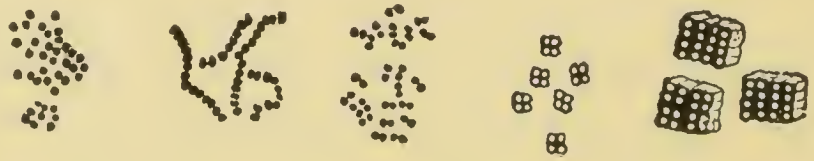
Different bacteria vary greatly in size, the average of the rod-shaped bacteria being about $\frac{1}{25000}$ inch, although there are known to be organisms so



FIG. 1.—BACILLI OF VARIOUS FORMS. (*Williams.*)

small they can not be discovered with the present microscopes.

Motion.—The power of motion in certain species of bacteria is due to hair-like appendages known as



STAPHYLOCOCCI. STREPTOCOCCI. DIPLOCOCCI. TETRADS. SARCINÆ.

FIG. 2.—(*Williams.*)

flagella, which by a lashing movement enable them to move through fluids.

Mode of Multiplication.—When bacteria have fully developed the fission takes place which divides the cell into two equal parts. The various kinds of bacteria divide to form pairs, chains, groups and

packets. Under favorable conditions fission occurs rapidly (the hay bacillus in thirty minutes), from which may be readily estimated the enormous multiplication which would result should nothing occur to check the reproduction; but as is the case with



FIG. 3.—SPIRILLA OF VARIOUS FORMS. (*Williams.*)

all organisms, mathematical increase never continues without check or hindrance. In the case of bacteria, the organisms, in their activity upon their food substances, produce acids and other materials

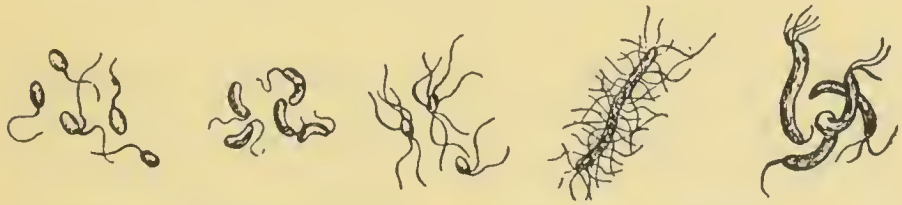


FIG. 4.—BACTERIA SHOWING FLAGELLA. (*Williams.*)

injurious to themselves which check further multiplication. Lack of proper food or moisture or favorable temperature, and conflict with other organisms are also checks upon growth and multiplication.

Spores.—Following a favorable period of reproduction certain bacteria enter into a stage known as spore-formation, which is characterized by the development of round or oval glistening bodies (spores) which are of dense structure and possess an extraordinary degree of resistance to heat, chemicals and other injurious materials. Except in rare instances a single cell produces but one spore. The stage of spore-formation is a resting stage and the stage of reproduction is known as the vegetative

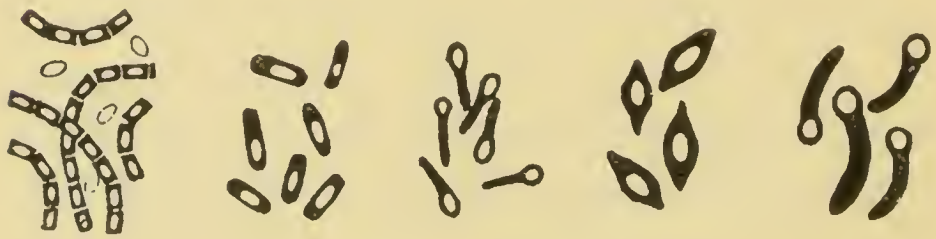


FIG. 5.—BACTERIA WITH SPORES. (*Williams.*)

stage. As soon as favorable conditions of temperature, moisture and food return, the spores again develop and take on the vegetative state, but the spore may remain dormant for months or years, a fact which is of peculiar significance in the consideration of certain infectious diseases.

Where Bacteria are Found.—Bacteria are found everywhere; wherever dust and air find their way bacteria are present. In the minutest crevices too small to be seen by the naked eye, like those in the

skin, upon the hair, upon all fabrics, furniture, walls, floors, plants, in the earth, water, food, and in fact everywhere.

Food.—Bacteria obtain their food from many sources, nitrogenous substances especially being quickly attacked by many species, as may be witnessed by the rapid decomposition of meats and milk.

The greater number of bacteria belong to the class known as *saprophytes*, which find their food in dead organic matter both animal and vegetable and cannot exist in living tissues; *parasites* on the contrary exist in living tissues and to this class belong nearly all of the disease-producing (pathogenic) bacteria. Some parasites are also able to lead a saprophytic existence.

The activities of bacteria are so rapid and complex that profound changes are produced in the materials upon which they grow and find their food. The changes which we know as fermentation and putrefaction are due to the action of saprophytes, while the parasitic forms found in the living tissues produce the changes which we call disease and death. The *saprophytes* acting upon the tissues of dead animals and vegetables resolve them into simpler elements, in which form they are appropriated as nourishment by the higher plants. The higher plants in turn furnish food for men and

animals, and thus the food supply is used over and over again in different forms, making what is known as the *food cycle*. Were it not for bacterial activities vegetation would be robbed of its supply of nourishment, and plant life would be speedily ended; which in turn would deprive the animal kingdom of food and thus life would be no longer possible.

The saprophytes may therefore be regarded as benefactors, while the parasites to which belong the disease-producing bacteria live at the expense of both animal and vegetable life.

Origin of Communicable Diseases.—"In the production of disease by microörganisms there are two main factors involved, namely (a) the multiplication of the living organisms after they have entered the body, and (b) the production by them of poisons which may act both upon the tissues around and upon the body generally. The former corresponds to *infection* and the latter is of the nature of *intoxication* or poisoning. In different diseases one of these is usually the more prominent feature but both are always more or less concerned." (Muir and Ritchie.)

No single kind of (pathogenic) bacteria can produce disease in all animals, nor are the disease-producing bacteria for animals the cause of disease in plants. A bacterium may produce disease in

man which is harmless for cattle, and on the contrary, man is not susceptible to all of the diseases of cattle. The tissues of animals and plants which afford favorable soil for the growth and multiplication of bacteria are known as the *hosts* and the host may not always favor bacterial activity; thus, an adult is usually resistant to the so-called children's diseases, and on the other hand, hunger, excessive fatigue and the wasting diseases all lessen the body's resistance and render the individual susceptible to infections of all kinds. The virulence (ability to produce disease) of the microörganisms also varies, and infection may depend upon the number of bacteria introduced into the body; and so it may be said that the virulence and number of the invading bacteria vary quite as much as the susceptibility of the host.

Entrance Into the Body.—The route by which the disease germs gain entrance to the body often determines the degree of the infection, typhoid bacilli and the spirilla of Asiatic cholera when taken with food or water produce far more serious disturbances than when injected under the skin; infections from pus germs through an abrasion (superficial break) of the skin may result in a slight local disturbance, while the same amount introduced into a deeper wound or into the abdominal cavity would probably result in a serious infection and

possible death. The tonsils afford favorable conditions—temperature, moisture and ease of access—for many kinds of bacteria.

The Defenses of the Body.—The unbroken skin is usually impassable to bacteria, virulent organisms being often found upon the skin of perfectly healthy persons, where they appear to be harmless unless an abrasion occurs which affords entrance into the deeper tissues. This fact has long been known, but it is only recently that the possibility of healthy individuals being "carriers" of infection to more susceptible persons has been seriously considered.

The mucous membranes which line the mouth and other cavities of the body would prove favorable sites for the growth of bacteria were it not for the frequent removal of the mucus which they secrete. The mouth of a healthy person may contain bacteria of many kinds, but the saliva has a slight disinfectant power and serves as a constant wash to the membrane of the mouth.

The normal gastric (stomach) juice is decidedly unfavorable to the growth of bacteria, although it does not always kill them, as they are often found in large numbers in the intestines. The moist surfaces of the air-passages retain most of the bacteria contained in the air, before it reaches the lungs, and the hairs of the nasal and ear passages and the eye-

lashes, make some obstruction to the entrance of bacteria.

It is known that certain cells and substances of the blood are antagonistic to bacteria, the infected individual owing his resistance to the protective powers of the blood.

Immunity.—A person who is not susceptible to a communicable disease, such as smallpox, is said to be immune. Immunity may be natural or acquired: natural in the case of man's resistance to many of the diseases of the lower animals and acquired, following one attack of certain infectious diseases, as in smallpox or yellow fever.

The use of diphtheria antitoxin as a protection from diphtheria and vaccination against smallpox and typhoid fever are also examples of acquired immunity.

During the summer of 1911 a United States army division of over 12,000 men occupied a camp at San Antonio, Texas, for four months. All of these men were vaccinated against typhoid fever and only a single case occurred during the summer, although the conditions of camp-life favor the spread of the disease to an alarming extent.

At the present time the principal diseases known to be due to microörganisms are:

Class I. Septicæmia, influenza, pneumonia, diphtheria, typhoid fever, tuberculosis, Asiatic

cholera, bubonic plague, meningitis, tetanus, infantile paralysis, leprosy, gonorrhœa, syphilis, relapsing fever, glanders and anthrax.

Class II. To this class belong those diseases caused by organisms which are yet unknown: smallpox, scarlet fever, measles, mumps, whooping-cough, Rocky Mountain spotted fever, typhus fever, yellow fever, hydrophobia (rabies), foot-and-mouth disease.

The Protozoa are the lowest group of the animal kingdom, and play an important part in causing diseases of mankind, especially in the tropics. Among the well-known diseases of protozoan origin are malaria, amebic dysentery and sleeping-sickness. In the case of sleeping-sickness, the tsetse fly acts as an intermediate host, as does the female Anopheles mosquito in the case of malaria; in both instances the infection being borne from one person to another by the infected insects. Several wide-spread and serious plagues of domestic animals are due to protozoa.

LESSON II

CAUSES AND TRANSMISSION OF DISEASE

SUGGESTIONS FOR DEMONSTRATION

1. Show quick-lime and air-slaked lime and demonstrate preparation of milk of lime.

2. Show 5 per cent. solution of carbolic acid and explain the dangers in its use, especially of burning.

3. Show sulphur candles and how to use them for fumigation. Show how to close crevices and how to avoid danger of fire during fumigation.

Causes of Disease.—The causes of disease are divided into two classes, direct and indirect.

The *direct* causes may be chemical such as poisons, mechanical such as injuries, and vital such as the bacteria of special diseases.

The *indirect* causes are age, sex, heredity, race, occupation, climate and habits; as an illustration: the direct cause of tuberculosis is the tubercle bacillus while the indirect causes may be numerous, as age, race, occupation, unsanitary surroundings, and heredity.

Resistance to disease varies greatly in individ-

uals. Anything which lowers the general health, such as dissipation, overwork, lack of food, fresh air and sunlight, and unclean surroundings, lessens the resistance of the body. This is commonly illustrated in the case of infectious diseases; not all persons exposed to scarlet fever nor all persons who drink typhoid-infected water contract the diseases, the difference no doubt being largely due to the degree of resistance in the individuals. Persons leading regular lives with proper food, shelter, clothing and cleanliness are comparatively safe from disease, while on the contrary overcrowding, bad air and food, intemperance and filth lower vitality and render men susceptible to disease.

Age.—The highest death rate occurs in the very young or the very old—before five and after sixty-five years of age.

Infants suffer from disorders of digestion, the effects of bad air and uncleanliness, the lack of sunlight and from certain so-called children's diseases, —measles, chicken-pox and scarlet fever.

Tuberculosis in many different forms is common with children as well as adults, it being one of the diseases affecting all ages.

Erysipelas and smallpox are common to all ages.

Typhoid fever occurs most frequently between fifteen and forty-five years of age.

Among the old, cancer, heart, kidney and digestive disorders are common.

Sex.—The death-rate among women is lower than among men, due no doubt to the fact that the daily life of men exposes them not only to accident but affords greater opportunity for contact with disease.

Race.—Differences in the susceptibility of the races to various diseases have been observed particularly in comparing the whites and the blacks.

Occupation.—The conditions surrounding certain occupations predispose the workers to certain diseases.

The inhalation of dust from fabrics, minerals, and woods is conducive to diseases of the lungs; in fact, almost all forms of industrial dusts may be harmful.

Soldiers, sailors, fishermen and others are exposed to extremes of temperature and moisture.

Lead poisoning occurs with painters and plumbers; and other chemical poisons affect dyers and different workmen. The inhalation of gases from iodine, ammonia, chlorine and naphtha are all injurious.

Occupations which compel cramped positions and dark, badly ventilated rooms are a menace to health.

Overcrowding, overwork and underfeeding are

probably the most common causes of lowered resistance to disease among laborers.

Heredity may be defined as the influence of parents upon offspring. "In predisposing to disease, heredity manifests itself more through the transmission of a peculiar habit of body rather than by the transmission of the disease itself. * * * " (Abbott.)

The **season** has much influence upon the prevalence of certain diseases. During the winter and early spring months catarrhal colds, besides the acute infectious diseases, prevail, but it is still a question of how much of these are due to the cold damp weather, and how much to the effects of bad air and lack of cleanliness, which are so common in winter.

Malaria and typhoid fever are more prevalent in the early autumn than any other season.

TRANSMISSION OF DISEASE

In all communicable diseases the transfer of the disease germs is accomplished by the contact direct or indirect of the sick and well, or by means of infected food or water, or by such agencies as dishes, which may carry infective materials, or by soil, by insects, vermin, or much more rarely by air.

Formerly it was thought that much infection, especially from the eruptive diseases, was air-borne,

but research has proved that germs floating on particles of dust speedily become dry and lose much of their vitality; and the same researches have led the way to observe that contact infection is much more common than had been supposed.

A Recent Discovery.—"Undoubtedly the most fruitful medical discovery of the last century and perhaps of all time was the parasitic nature of infectious diseases. Probably the most important discovery bearing on preventive medicine since the demonstration of the bacterial origin of disease, is that disease germs frequently invade the body without causing disease." (Chapin.) It has been found that many patients harbor bacteria for weeks, months or even years following an infection and are dangerous distributors of disease, known as "carriers," also that some healthy individuals without a history of illness also harbor living bacteria which may infect susceptible persons with whom the "carrier" comes in contact.

In addition much light has been thrown upon the danger from patients suffering from attacks so mild they are often not recognized, who may convey infection to others which will prove of the most serious character.

In the case of typhoid fever a large number of carriers have been found; in the other communicable diseases less is known although sufficient evi-

dence has been collected to prove that in practically all of them carriers are a most important factor to be reckoned with in the transmission of infection. These experiments and observations have explained many epidemics which were formerly of unknown

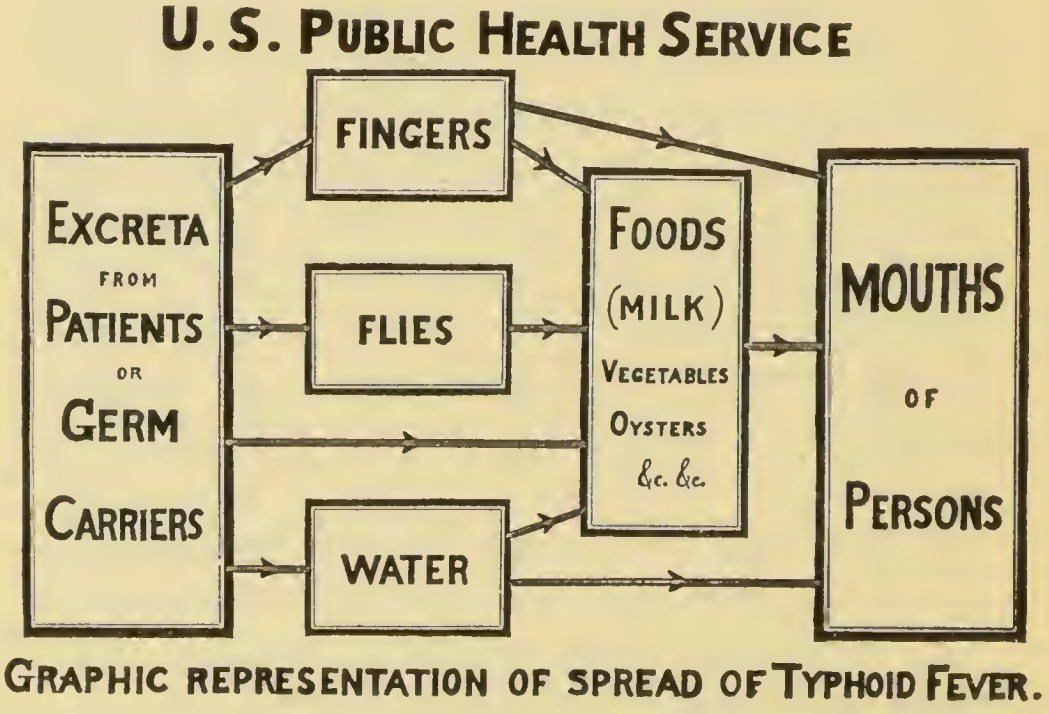


FIG. 6. (*L. H. Wilder.*)

origin, and will no doubt bring about entirely new methods of observing the convalescents of all communicable diseases.

Many of the former theories concerning the sources of infective materials thrown off from the body in the different diseases have been modified

by investigation, but it is enough for the mother or home nurse to know that all of the discharges—feces, urine, sputum, mucus, saliva or pus discharges from any or all infectious disease—may be dangerous to the well, and that scrupulous, constant cleanliness of person, bedding and utensils for the use of the sick or well is the foundation upon which rests the prevention of the spread of infection.

Under the head of infection by contact we must not only consider the danger when the well touch the sick, but that the well may also convey infection from the sick to other persons, and this brings us to the most common vehicle for the transfer of disease germs, viz.: *human hands.*

In our daily lives we constantly touch and handle things which are touched and handled by hundreds of others. We cannot go into a street car, a shop, a restaurant, an office, a school, a hotel, a toilet room nor a hospital without doing so; how many of us remember not to touch or convey anything to our mouths unless our *hands* are *clean?* If we would all remember this one thing an immense number of cases of typhoid fever, diphtheria and tuberculosis alone would be avoided.

Children are not naturally clean in their ways and three of the earliest good habits to teach them should be, (a) to keep their fingers and everything else but food and drink away from their mouths;

(b) the proper use of their handkerchiefs, and (c) to scrub their hands before meals and after a visit to the toilet room.

Frequently, otherwise clean food or water is infected by the unclean hands of housewives, cooks, bakers, waiters, milkmen, grocers and others.

Insects.—The household fly breeds in manure heaps, privy-vaults, garbage-cans and other unclean accumulations and carries such filth upon its feet

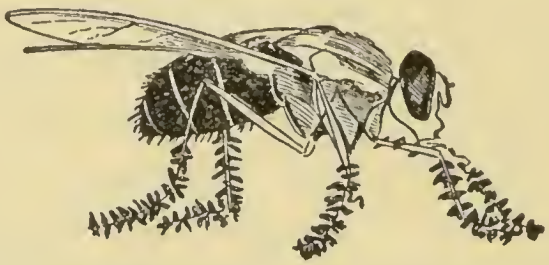


FIG. 7.—A FLY WITH GERMS (GREATLY MAGNIFIED) ON ITS LEGS. (*U. S. Dept. Agri.*)

into our homes, where it is often deposited in the baby's milk and upon our food, dishes, and table linen. If the discharges from any infectious disease are left open to flies, the human beings in the neighborhood are in constant danger, particularly from cases of typhoid fever and tuberculosis.

A spectacular campaign against flies has been waged all over the country for several years, but it must be admitted that if more attention was given to the barn-yards and garbage-cans, less time would

be needed for killing the flies. Wire fly-screens for every window and door are as much a necessity for houses as the windows and doors themselves.

Roaches and water bugs are pests in city houses and infest dish-sinks, ice-boxes and food supplies, and if they were only repulsive from the standpoint of cleanliness, should be destroyed. Just how far they may carry infective materials is not known, but it is reasonable to suppose they may carry filth upon their feet and deposit it wherever they go.

Bedbugs by their bite are thought to carry disease and while this has not yet been definitely proved, every effort should be made to exterminate them.

Mosquitos are carriers of malaria and yellow-fever; fleas carry bubonic plague, and the tsetse fly is the carrier of sleeping-sickness.

Cats, dogs, and other household pets may carry infection in their fur.

The **channels** through which infective materials enter the body are by abrasions of the skin or mucous membrane, through the mouth or nose to the tonsils, to the bronchial tubes and lungs, and to the stomach and intestines; to enumerate the ways in which infective materials may be conveyed to these channels would be to review in detail the daily routine of the human race; but if we seriously con-

sider the channels we may easily understand how great a proportion of infection takes place through the mouth—the germs of typhoid fever, tuberculosis, diphtheria, pneumonia, influenza, cholera, and probably scarlet fever, measles and infantile paralysis, may all enter the body through the mouth—and when we still further consider that nothing goes into our mouths but what we convey to them,—even the quality of the air we breathe we may control to a certain extent,—we will still further understand that our escape from communicable diseases depends very largely upon our personal habits.

Daily baths lessen the danger of infection through abrasions of the skin; clean hands and finger-nails greatly lessen the danger of infective materials being conveyed to the mouth; clean teeth and regular visits to the dentist, clean food and clean surroundings are all of the greatest importance in preventing infections of all kinds.

In the chapters upon personal and household hygiene will be found further reference to the conveyance of infectious materials through bad housekeeping methods and unclean personal habits.

Quarantine is "the adoption of measures to prevent the introduction of diseases from one locality to another."

The necessity for restrictions in certain diseases has been recognized from the earliest times, leprosy

probably being the first disease for which isolation was practised.

By usage the word quarantine is used to designate port, land, State, inter-State, municipal, railway, house or room quarantine.

Inter-State quarantine is used to prevent the extension of communicable diseases by common carriers.

House quarantine is employed against smallpox, scarlet fever, measles, diphtheria, cholera and typhoid fever. The patient should be isolated from other members of the family and except in cases of typhoid fever all visitors should be excluded and members of the household should be forbidden attending business or school or entering public conveyances. The house should be placarded until the recovery or death of the patient.

Disinfection.—Certain agents which are employed to destroy the bacteria of special diseases and limit the spread of infection are known as disinfectants.

Disinfectants are divided into three classes: Light, heat and chemicals.

Light.—The direct rays of the sun are powerfully disinfectant, destroying or retarding the growth of many disease organisms. The bacilli of tuberculosis, of typhoid fever and the spirilla of cholera are destroyed by strong sunlight.

Sunlight has a sterilizing effect upon water and sewage.

In the location of houses and the arrangement of windows the amount of sunlight which will be available should be seriously considered; and in the routine care of a house the exposure of bedding, furniture, rugs, draperies and clothing to the direct rays of the sun should be carried out regularly. The country custom of exposing all utensils used for milk to the rays of the sun is based upon the principle of disinfection.

Heat, either dry or moist, is an effectual disinfectant. Moist heat either as steam under pressure or by boiling is much more effectual than dry heat. Live steam is employed in the sterilizers commonly employed in hospitals for the disinfection of all surgical instruments and dressings, utensils, clothing, bedding and water.

Dishes, washable clothing except woolens, surgical instruments and utensils may be sterilized by boiling for half an hour.

The process employed in laundering linen, when properly done, is one of disinfection; the clothing is first washed in warm soapy water, boiled in soapsuds, rinsed until free of soap, dried in the sunlight and ironed with a hot iron. In case of infectious diseases the bed and body linen should be wet with a disinfectant as soon as removed and kept wet

until immersed in the first soap-suds. Infected clothing should be handled as little as possible and in instances where disinfectants are not available the clothing should be kept wet with cold water until ready for laundering; while cold water does not kill the bacteria it lessens their vitality and prevents infective material from being blown about as particles of dust into food or dishes.

An antiseptic retards the growth of bacteria but does not kill them. Cold is an antiseptic but not a disinfectant. The bacilli of typhoid and diphtheria have been known to survive freezing.

Chemical disinfectants are too numerous to even be listed, a number of them on the market being of no possible value.

The oldest and still one of the best disinfectants is *quicklime*—air-slaked lime is of no value. Mixed with water to the consistency of cream, known as milk-of-lime and used to disinfect excreta and privy vaults, it cannot be excelled. In using milk-of-lime for bed-pans, urinals, sputum cups or privy vaults the rule is—and the same rule applies to all disinfectants—that the amount of disinfectant should be double in volume the amount of excreta. Lime is cheap, not dangerous to handle and generally available even in remote country places. By the addition of water the common whitewash for cellars, stables, barracks, jails and fences

is made, which is the best disinfectant known for the purpose.

Soap is also another disinfectant which has not been given credit for its work. Its chief virtue lies in the fact that it removes the infective material (dirt); for instance a bed-pan used by a typhoid patient may be disinfected with carbolic acid but only soap and water combined with a brush will remove every particle of excreta and leave the crevices and surfaces bright and clean. Again, carbolic acid will disinfect the sputum of a tubercular patient but soap and water is also needed to remove it.

If the patient or the mother or the nurse has an accumulation of infected dirt under the finger-nails the carbolic acid is an excellent disinfectant, but thorough scrubbing with a stiff brush and strong soap suds is also needed.

For room-disinfection soap can be used upon floors, woodwork, windows and furniture to the best advantage.

Bichloride of mercury (corrosive sublimate) is a well-known disinfectant, but should not be used except by those who fully understand its dangers as it is a deadly poison.

Carbolic acid also is a well-known disinfectant derived as are many others from coal-tar. None of these disinfectants should be left where it may

be handled by children or servants, in fact the necessity for poisonous disinfecting agents does not arise unless cases of infectious illness exist.

There are many commercial disinfectants of known value, most of them products of coal-tar, as creolin, lysol and crenosol, which may be used under the direction of the doctor.

Alcohol is a safe disinfectant to keep in the family medicine closet: for disinfecting thermometers, scissors, needles, or small surgical instruments it is excellent.

For **fumigation** the fumes of sulphur or formaldehyde are employed; in the former the destruction of bacteria is very doubtful, but for killing bedbugs and roaches, it is excellent if repeated four or five times, at intervals of a week, and as both bedbugs and roaches may be "carriers" as well as evidences of poor housekeeping it is desirable to destroy them.

Fumigation to be effectual should be done by some person who is not only experienced in handling the materials but who understands the methods; as ordinarily done in most households it is a waste of time and materials.

LESSON III

FOOD, WATER, ICE

SUGGESTIONS FOR DEMONSTRATION

1. Compare the amount of cream in milk of excellent quality and one of poor quality, after standing undisturbed in test-tubes for at least twelve hours.
2. Demonstrate the pasteurization of milk with home utensils.
3. Show fresh, clean eggs and stale, dirty eggs.
4. Show fresh and stale vegetables and fruit.

Human efficiency largely depends upon a properly balanced diet of wholesome food, and those responsible for its selection should have some knowledge of the sources from which it is derived and the methods employed in its preparation and distribution.

Food may be divided into two classes—animal and vegetable.

ANIMAL FOODS

In this class should be included not only the flesh of animals used as food, but their products as well, such as milk, butter, cheese and eggs.

Milk

A pure milk supply is of utmost importance, and in nearly all large cities it is subjected to careful inspection. In some states a chemical analysis is required by law and a minimum percentage of cream demanded, usually 8 per cent. by volume. Milk should be purchased from a reliable dealer and if possible one should ascertain whether hygienic methods prevail in the dairy producing it. The quality of milk depends upon the condition of the cow, its food and surroundings. Special care is necessary in selecting milk for infants, children and invalids.

Sources of contamination:

Unhealthy cows
Improper food
Unclean drinking water (stagnant)
Dirty utensils
Unclean stables
Unclean methods of milking
Use of impure water in diluting milk
Improper care in transportation
Carelessness in kitchen
Exposure to air.

Precautions.—Milk should be delivered in covered bottles—much safer if sealed—with label bearing dealer's name.

Utensils should be used for nothing else. They should be carefully washed and scalded, or better,

boiled for a few minutes, and kept in a clean place protected from the dust. If milk is purchased in a bottle the outside of the bottle should be washed before opening, and when returned to the milkman it should be clean.

Bacteria develop rapidly in milk at even the temperature of an ordinary kitchen. For this reason milk should be kept on ice or in a cool place, and always protected from dust and odors.

Sour Milk and Buttermilk.—The souring of milk is due to the formation of lactic acid, which is unfavorable to the growth of many germs of decomposition and infectious diseases. Both sour milk and buttermilk are wholesome and nourishing if the milk is originally of good quality and properly safeguarded during the process of souring. Lactic acid, it is said, is a preventive of growth of harmful bacteria in the intestine. Metchnikoff states that the habitual use of sour milk or buttermilk tends to prolong life.

Sterilization.—Milk may be sterilized by bringing it to the boiling point. This process destroys bacteria but renders the milk less palatable and less easily digested. It also retards souring. Such milk can be used for cooking purposes.

Pasteurization is a method of destroying the bacteria at a temperature below the boiling point, and is more desirable when milk is to be used for

infants, children or invalids. For full directions see page 244, Appendix.

Canned or **condensed milk** forms a very good substitute when fresh milk cannot be obtained, and is in general use in tropical countries. Many persons prefer to use condensed milk in warm weather for the reason that it does not need so much care and attention as fresh milk.

Adulteration.—Milk may be adulterated by the addition of water, coloring matter, preservatives, and a thickener, gelatine being generally used for this purpose. The removal of cream is a common practice, and can usually be detected by any one accustomed to handling milk and knowing how much cream a pint or quart bottle should contain.

Butter

Butter requires the same care as milk. It easily absorbs odors and should be kept in a covered stone or glass dish, at a low temperature. Rancid butter is sometimes renovated, but its sale as fresh butter is prohibited by law in most states.

Butterine and **oleomargarine** are made from a combination of butter and other fats. If good materials are used in their preparation they are just as wholesome, but less palatable than butter.

Nearly all butter is colored, but the coloration is harmless and is not classed as an adulteration.

Cheese

Cheese varies much in quality, depending upon the milk used in its manufacture. There are many varieties, each country having its own special favorites.

Eggs

Eggs contain all the elements necessary to support life, and if properly cooked are easily digested. Hens' eggs are most commonly used, and if purchased in the shell cannot be adulterated. They differ in size, quality and flavor, even when fresh, due to the breed and condition of hens and their food supply. The shells of eggs are porous and may absorb odors and germs from filthy nests or packing material. The shell of a fresh egg has a slightly rough appearance.

Test of Fresh Eggs.—(1) Hold the egg between the hands so that the light of a candle shines through it. If fresh, it is more transparent in the center; if stale, at the poles. (2) Make a solution of two ounces of common salt in a pint of water. An egg one day old will sink in this solution, but will not quite reach the bottom; an egg three days old will barely float beneath the surface, and an egg a fortnight old will float above the surface, only partially dipping beneath it (Siebel).

Preservation of Eggs.—A large proportion of

eggs placed on sale in cities during the winter months are cold storage eggs, but if they have been kept at a sufficiently low temperature, say 30° or 40° Fahrenheit, they suffer no harmful deterioration, provided they are not kept for too long a time after coming out of storage. Such eggs lose in weight, and frequently acquire an unpleasant flavor. Eggs may be kept fresh by coating with some substance which excludes the air. A 10 per cent solution of waterglass or melted paraffin may be used for this purpose.

Canned or **evaporated eggs** are advertised. These, it is alleged, are used by some bakers. Preparations of this kind are subject to adulteration, and are probably made from broken or not strictly fresh eggs.

Meat

Special care should be exercised in the selection of meat, as it not only readily decomposes, but the animal may have been diseased. Meat should not be eaten until at least twenty-four hours after killing. The color should be uniform and the meat free from odor. Egbert says the following meats should not be eaten:

"1. The flesh of all animals dead of internal diseases, or which have been killed while suffering from such diseases, or animals killed by overdriving.

"2. The flesh of animals with contagious diseases that may be transmitted to man.

"3. The flesh of animals that have been poisoned.

"4. The flesh of animals with severe infectious diseases, as pyæmia, etc.

"5. Flesh that contains parasites that may be transmitted to man.

"6. All putrid flesh."

The necessity for governmental inspection is evident, but it is only carried out systematically in a few of our large meat producing centers.

Disease germs and parasites are destroyed by thorough cooking, but a poisonous substance unaffected by cooking sometimes develops in meat which has undergone putrefactive changes.

Meat having any taint or unpleasant odor should be avoided.

Preservation of Meat.—The refrigeration or cold storage of meat has revolutionized the methods of marketing and made it possible to transport meat in good condition to all parts of the world. To be absolutely safe the meat should be quickly cooled after killing and kept at a uniform temperature, either frozen or slightly above the freezing point. In some localities laws have been passed limiting the length of time food may be kept in cold storage. All foods deteriorate rapidly when removed from cold storage.

There are numerous other methods of preserving meat, such as canning, drying, pickling, smoking, salting, and the use of chemicals. Such meats serve a useful purpose in localities where it is difficult to secure or keep fresh meat, but they are usually more expensive, with their nutritive and digestive values impaired. Canned meats and other products which have lost their identity are generally made from an inferior quality of meat. It is also safe to assume that cooked meats offered for sale in delicatessen shops are, as a rule, not as carefully prepared and handled and more expensive than the same meat cooked at home. Smoked meats give a pleasing variety to a diet. Crisp, well-cooked bacon is an excellent fatty food, and 90 per cent of bacon fat is digested and absorbed.

Sea Food

All sea foods decompose rapidly when removed from the water and bacteria develop in them at a relatively low temperature.

In *selecting fish* the appearance of the eyes should be noticed. If fresh they will be well rounded and bright.

Oysters and **clams** are the most commonly used shellfish, and they should always be purchased from a reliable dealer. Oysters may be contaminated by the water in which they are grown, or by

water to which they are removed for fattening. Cases of typhoid fever have been traced to the use of raw oysters infected with the germs of typhoid.

VEGETABLE FOODS

In this class must be included cereals, fruits, nuts, vegetables, and their products, such as vegetable oils, sugar, syrup, molasses and honey.

Cereals and Grains

These form an important part of the food supply and in many countries are the staple articles of diet. The extensive use of oatmeal in Scotland, rice in China and Japan, and cornmeal in our own Southern States shows the economic value of these foodstuffs. The present method of delivering cereals, either partially cooked or ready for the table, in sealed packages, is convenient and cleanly. The majority of so-called breakfast foods are probably unadulterated, due to the stringent pure-food laws prevailing at the present time. It was common rumor though that, not many years ago, a freight carload of peanut shells, consigned to a manufacturer of breakfast foods, was discovered in a railroad wreck.

Cereals and flour must be kept in a dry place and protected from dust and insects.

Bread

Wheat or *rye bread*, with the addition of butter, cheese or milk, will sustain life indefinitely. To be able to produce a well-baked loaf of bread is no mean accomplishment, and it is to be regretted that the use of bakers' bread has become so general.

Patent bread mixers for family use are now on the market. They lessen the labor of bread-making, are most hygienic and, if the directions are explicitly followed, the results are almost certain to be uniformly good.

Bread should be cooled on a wire rack and placed in a covered bread-box or jar, which has been washed, scalded and dried in the fresh air or sunshine.

If *breadcloths* are used they should be frequently washed and boiled.

Bakeries.—There are sanitary bakeries producing wholesome bread, but the conditions found in many are deplorable. Some are located in damp, unclean cellars, with no sunlight and but little ventilation. These are breeding places for disease germs, and it is not strange that bakers often succumb to tuberculosis. From bakeries of this class the bread is carried uncovered, loaded into dirty delivery wagons, and put into bins or boxes at the corner grocery awaiting a second delivery to the

consumer. At times bread shows having been in contact with dirt. This may be due to the fact that in many cases the man who cleans and drives the horse handles the bread. The public has a right to demand that bakeries be well lighted, well ventilated, and conducted in a sanitary manner. Bread should be inclosed in paper and sealed before leaving the bakery. There has been objection to this on the part of some people who like hot or fresh bread. Bread must be allowed to thoroughly cool before being wrapped, for if wrapped while hot it will be soggy and unpalatable. The United States government has taken the matter up, and from experiments finds that when the bread is unwrapped if put in the oven for a short time it will regain all its freshness and crispness.

Adulteration of Flour.—There is little evidence that wheat flour is adulterated, but there is greater opportunity for the adulteration of gluten, buckwheat and prepared or self-raising flours.

Fresh or Green Vegetables

Many vegetables are eaten uncooked, and should be young, fresh, crisp and tender. They afford little nutriment, but give a pleasing variety to the diet and correct a tendency to constipation. They should be thoroughly washed before using, and avoided entirely in localities where the water is of

doubtful purity. Fresh vegetables should not be purchased from a grocer who displays his stock outside the door or exposes them to the dust and flies.

Preservation of Fresh Vegetables.—Canning is the most common method of preserving fresh vegetables, and the development of this industry has made it possible to secure a desirable variety of food at all seasons of the year and in all climates. While the methods employed in many canneries are known to be unsanitary, the products of reliable and well-known establishments are usually of good quality and unadulterated. Chemical preservatives are sometimes added, and the harmfulness of their use is a much-debated question. All foods should be removed from tin as soon as opened, or bad results are sure to follow. In cities where there are large markets the habitual use of canned vegetables is not desirable, as they are less wholesome and more expensive than the fresh vegetables in season.

Fruits form an important part of the diet in all tropical and temperate climates, and it is said that prehistoric man subsisted largely upon them. The varieties are endless, differing considerably in their composition, and are as a rule healthful and easily digested. Fruits should be mature, not over-ripe, and of good quality. The skin or protective cover-

ing should be unbroken and washed before using. The outer covering of some fruits, notably berries, is easily bruised, and such fruits exposed to dust or flies are easily contaminated; for that reason they should not be used unless they are firm and in good condition.

Preservation of Fruits.—There are numerous methods of preserving fruits, which furnish an agreeable and wholesome addition to the diet when fresh fruit cannot be easily obtained. Fruits may be dried, evaporated, canned, or preserved in sugar, vinegar and spices. They are also made into syrups, wines and vinegar. Coloring-matter or a preservative may be added, but the use of any deleterious substances is prohibited by law. Cheap jams and jellies are sometimes made from flavored fruit refuse, with the addition of a filler, such as starch. Glucose is often used instead of sugar. The home preservation of fruit products for winter use is not a difficult matter and provides a less expensive and much better food than can be bought ready put up. The addition of sugar increases the nutritive value of fruit and furnishes an excellent form of sweet especially popular with children. As fresh fruit can be obtained during the whole year in large cities, it is far preferable to preserved fruit of doubtful quality.

WATER

Composition.—Chemically pure water, which is never found outside of the laboratory, is colorless, odorless, tasteless and of neutral reaction, and composed of 11.11 parts hydrogen and 88.89 parts oxygen. Water contains a great variety of substances both mineral and organic, which it derives from the air and soil. The most common mineral substances found in water are salt, iron and lime, the amount depending upon the soil from which the water is taken. In falling as snow or rain, water absorbs both mineral and organic matter from the air. From the standpoint of hygiene water is pure when it contains nothing injurious to health, and impure when it is unfit for domestic use.

Rain water is the purest of natural waters although it may absorb great quantities of impurities in falling.

Spring water is rain water which has penetrated the soil, and by its action of solution may contain the chemical properties of the soil. Many springs contain medicinal qualities of value but are unfit for domestic use.

Artesian or deep well water is of the purest, but may contain the chemical properties of the strata through which it passes and be unfit for constant use.

Well water from shallow wells is most easily polluted by surface washings. To prevent the drainage of surface water into the well, the upper part of the wall of the well and the curb should be constructed of concrete, never of wood. The curb should be higher than the surrounding earth, which should have a sufficient slope to carry off all water.

River and other surface waters such as ponds and lakes are derived from springs and the rainfall. The quality of the surface water depends upon the composition of the soil, the season, amount of rainfall, the current, the character of surrounding vegetation, and nearness and number of human habitations. The water of the Great Lakes is remarkably pure at a sufficient distance from the shore to be unpolluted by sewage.

Sea water contains many chemical properties which render it unfit for domestic or commercial use.

The impurities contained in water are those substances which directly or indirectly may be injurious to health, and may be solid or in solution, gaseous, organic or inorganic. Harrington in his great work on Practical Hygiene says: "It may be laid down as a general rule regardless of the fact that all impurities do not necessarily breed disease or undermine health, that all water containing or

likely to contain domestic sewage, abundant growths or minute vegetable and animal organisms, decomposing matter of animal origin, dissolved vegetable matter of an inherently toxic nature or undergoing decomposition, or excessive amounts of mineral matter, should not be accepted as fit for human consumption. Especially should we bear in mind that water which is quite free from disease organisms and toxic matter today may contain them in abundance tomorrow."

Mineral matter in water may produce disorders such as diarrhœa or constipation. Lead-poisoning due to the action of water upon lead water pipes not infrequently occurs.

Organic pollution of water arises from dead organic or animal matter and living organisms which may be vegetable or animal. The sources of organic pollution arise from surface washing, the discharge of sewage into the water supply and from vegetable growths. The three communicable diseases which may be positively said to be carried by water are cholera, dysentery and typhoid fever. Cholera being an almost unknown disease in this country, the epidemics of typhoid fever concern us most. Ordinary sewage pollution does not necessarily cause either cholera or typhoid fever: the water must contain the specific germs of the diseases. It was formerly supposed that the germ of

typhoid was found only in the discharges from the bowels, but it is now known to be found in the urine for a much longer period, even after convalescence, which accounts for many epidemics of previously unknown origin. In the country the discharges are usually deposited in the privy vault or upon the soil; in either case they are easily washed or filtered into wells, springs or streams supplying drinking water, therefore the disinfection of all discharges from patients suffering from typhoid fever is of vital importance, and in every case it should be thorough and under the jurisdiction of the health office.

Bacteria are found in all waters, but the hygienic point is to determine whether the water contains disease germs. The appearance of water is extremely deceptive as polluted water may be clear, sparkling and odorless. The purity of the water can be determined only in the laboratory.

Purification of water is accomplished by physical, chemical and mechanical means. The self-purification occurs by the settling of solid matter; by oxidation whereby the water in its movements comes in contact with the air which oxidizes the organic matter, and by sunlight, which destroys many bacteria. However, self-purification is not sufficient to render badly polluted water fit for domestic use. Chemical purification is employed to cause an in-

soluble precipitate which settles, carrying with it other solid matter and bacteria.

Chloride of lime has been employed for years to disinfect sewage but only recently has come into use for disinfecting an impure water supply. One part of chloride of lime to 1,000,000 parts of water is the rule for ordinary water, the amount varying with the degree of impurity.

Filtration of the water supply of large cities is a practical and efficient method of purification. These filters are concrete basins, filled to half their depth with layers of gravel and fine sand, the water entering at the top. They are cleaned by draining, scraping the sediment carefully, and exposing the filter to sun and air.

Household Purification of Water.—Properly the city should supply pure water, thus avoiding the domestic purification except in villages and the country. This is not always done, and every well-regulated household observes its water supply and provides some means for its purification when necessary. Impure water may be sterilized in small quantities by boiling. The water should stand for an hour to settle and should then be strained through several thicknesses of clean linen or cotton cloth and then boiled an hour in a double boiler tightly closed. The use of the double boiler prevents the metallic taste so unpleasant when boiled

in a tea-kettle. After cooling, the flat taste may be removed by pouring the water from one vessel to another until aëration has occurred. The use of domestic filters is the most common method of purifying water and when properly done in a good filter is very satisfactory. The cleansing of the filter cylinders or tubes consists of thorough scrubbing, followed by baking or boiling for an hour, and this must be done every day. The danger from the use of a filter containing an accumulation of impurities from previous use is far greater than the danger from any ordinary water supply.

ICE

Freezing does not free water of all of its impurities. Typhoid germs, as well as some other germs, retain their vitality in ice for a very long time. Artificial ice is not necessarily pure ice, for pure ice, whether natural or artificial, must be made of pure water.

LESSON IV

AIR, VENTILATION, HEATING, LIGHTING, SOIL, SEWAGE AND GARBAGE

Composition of the Atmosphere.—Air consists of a mixture of gases of remarkable uniformity which envelops the earth. Air is a transparent, colorless and odorless mixture of oxygen (21 per cent), nitrogen and argon (78.7 per cent), carbonic acid (carbon dioxide, 0.03 per cent), aqueous vapor, a trace of ammonia and a variable amount of ozone, organic and other matters.

The mixture of air is mechanical, its wonderful uniformity being governed by the relative processes of animal and vegetable life and the law of the diffusion of gases, which is that "a gas expands into a space where there is another gas as freely and as rapidly as if there were a vacuum."

Oxygen is the element in the air which supports life. It is constantly being taken up from the air by respiration and returned to it in combination with carbon, known as carbon dioxide, which is in turn taken up by vegetation, the carbon being

retained and the oxygen returned to the air, thus maintaining the uniformity of the atmosphere.

Human life is impossible with less than four-fifths of the normal proportion of oxygen and equally so when greatly increased. The decrease of oxygen to less than 13 per cent causes respiration to become slower and more difficult and asphyxia (suffocation) and death soon follow. Fatal asphyxia occurs very speedily when the volume of oxygen has decreased to 3 per cent.

Nitrogen, the principal constituent of air, serves to dilute the oxygen and to render it respirable.

Carbon dioxide is found in all air, and results from the oxidation of organic matter, from respiration, fermentation, combustion and from the chemical action of the soil. Within the limit of three parts to 10,000 carbon dioxide may not be considered an impurity of the atmosphere. The respiration of millions of human beings and animals, the combustion of coal, wood, gas and other fuels and the huge volumes sent forth from the soil-air throw tons and tons of carbon dioxide into the atmosphere which in turn is purified of its excess by the absorption of it by vegetation and by great bodies of water.

The aqueous vapor in the air varies with the temperature, evaporation and condensation going on continuously. The proportion of humidity most

agreeable and healthy for human beings is about 75 per cent of saturation, at any given temperature.

Dust is considered a normal constituent of the atmosphere. It may be organic or inorganic.

Bacteria are numerous in the atmosphere of cities, towns and dwellings but in considering their presence in the air it should always be borne in mind that by far the greater proportion are harmless. It is supposed that disease germs in the air are always adherent to particles of dust.

Effects of Bad Air.—The immediate effects of inhaling impure air are discomfort, followed by headache and nausea, but the continued breathing of bad air causes a gradual loss of health manifested by pallor, languor, loss of appetite and worse than all the loss of resistance to disease. Certain occupations expose workmen to impure air from special sources and many States have passed stringent laws requiring sufficient air space and better ventilation for factories and workshops. Tuberculosis is especially associated with the over-crowding and impure air in tenements, jails, factories, barracks and schools.

The impurities of the air in dwellings arise from respiration, perspiration, combustion, faulty sewerage and very largely from bad housekeeping which permits uncleanliness of the dwelling and its occupants. With fairly good ventilation the air of a

dwelling cannot be good if it be filled with dusty carpets, curtains and walls; if both bed and body clothing be soiled; if cellars, pantries and ice boxes are filled with decaying food and unclean utensils; if bath rooms and kitchen sinks are dirty and drain pipes filled with an accumulation of grease and other filth. It is not too much to say that most dwellings would have better air if there were less furniture and decoration and more attention to every-day cleanliness.

VENTILATION

Ventilation is the process of supplying buildings and rooms with a constant supply of pure air to replace the discharge of impure air. One of the most important facts to be remembered in connection with ventilation is that no matter how perfect the system may be, it cannot do more than remove the impurities due to respiration and combustion, the solid and organic matter in the atmosphere can only be removed by the practice of cleanliness both inside and outside of the building.

The amount of air required is from 30 to 50 cubic feet per minute for each person, less than 30 producing impaired vitality. At such a rate a person in a confined space would require 3,000 cubic feet of air hourly to dilute the impure air from his own respiration.

The chief force in ventilation is movement of air, which is due to diffusion and the differences of density of the air at different temperatures. The diffusion of carbon dioxide and other gaseous impurities from rooms into the outer air takes place not only through windows, doors and crevices, but through the walls, the amount of diffusion depending upon the character of the building material, the difference between the indoor and outdoor temperature and the direction and force of the wind. Damp walls prevent diffusion which is the chief reason for their unhealthfulness. The more tightly fitting windows and doors are made and the better the walls are constructed the more obstruction is offered to natural ventilation, but inlets and outlets properly placed afford assistance to natural ventilation which may be supplemented by the temporary opening of windows and doors. To supply a sick person with a constant supply of pure air without draughts often taxes one's ingenuity. Partial ventilation may be secured by fitting a board or piece of window glass 18 or 20 inches wide upright inside of the lower sash which may then be raised behind it. Covering the wire window screen with cheesecloth or very thin flannel will allow the entrance of air without perceptible draught. To ventilate a sick-room quickly and thoroughly an open umbrella may be placed with the handle at the patient's side

and the edge of the umbrella resting behind the pillow, the whole covered with a sheet or thin blanket and every window and door opened widely for five minutes.

A free circulation of air is at all times most important, and especially so in cases of fever, when the over-heated air surrounding the patient may be compared to a blanket, preventing the radiation of heat from the body.

The mechanical systems of ventilation employed in hospitals, schools, theaters and other public buildings can not be considered in this connection.

HEATING AND LIGHTING

The ventilation and heating of buildings are so closely connected that they must necessarily be considered together.

Fresh air in abundance is required for the process of combustion to replace the impure air arising from the consumption of oxygen by combustion and to replace the heated air which escapes.

Required Temperature.—An average temperature of 70° F. for living rooms and 65° F. for bedrooms is considered the healthiest degree of warmth for vigorous adults, with a slightly higher temperature for young children and the aged.

Overheating is a very serious fault in many buildings.

Extreme dryness in the air is another grave fault of most heating systems, but it is one which may be largely overcome by intelligent oversight. The small house which is necessarily invaded by the steam from the kitchen is in reality more healthful than its more pretentious neighbor wherein is a fine furnace and no moisture. Shallow basins of water on the backs of stoves, radiators and registers if kept full will remedy the dryness but their care must be constant not fitful.

Moist air is easier to heat than dry and occupants of buildings with the proper amount of moisture are freer from colds and coughs.

Fireplaces are an ideal method of heating from the standpoints of ventilation and cheerfulness, but as the sole means of heating in cold climates they are inadequate. A fireplace in a sick-room is particularly advantageous as a means of ventilation, and when the weather is too warm for a fire a lighted lamp standing in the fireplace creates a constant upward current of air.

LIGHTING

The proper natural lighting of all buildings is one of much importance to health, the direct rays of the sun being one of the greatest factors in promoting vigor of mind and body.

Persons working by artificial light during the

day become pale and languid, gradually losing mental and physical strength resembling plants which grow in the dark.

The influence of light upon health has been the subject of extensive scientific research and has led to many improvements in the lighting of all buildings. The elaborate over-dressing of windows with draperies is particularly unwholesome in cities where every ray of light and every breath of air is needed.

Artificial light should be abundant but not glaring and fixtures should be so placed and shaded that the strong rays do not shine directly into the eyes.

SOIL

The fact that we derive our drinking water from the soil, and at the same time that nearly all garbage is returned to its surface, compels us to give serious consideration to the relation of public health to the soil upon which we live.

Composition.—Soil is a mixture of sand, clay and other mineral substances, to which are added organic matter and living organisms.

Pollution.—As the purity of the soil depends almost entirely upon the amount of filth which is deposited upon the surface, it may be readily seen that the remedy for its pollution lies mostly in our

own hands. The present systematic disposal of the garbage and sewage of all large cities is the



FIG. 8.—AN OLD PRIVY, SHOWING HOW SOIL POLLUTION OCCURS. (*Bull. 32, U. S. Public Health Service.*)

greatest factor in the escape of modern communities from the devastating plagues of ancient times,

but in the small towns, villages and on many farms the soil surrounding the dwellings is frequently covered with an accumulation of household garbage, and saturated with drainage from stables and privy vaults which may gradually find its way into the well, from which the domestic water supply is obtained.

The soil contains large quantities of the gaseous products of putrefaction which goes on continually in the soil, to which is added in cities the gas from leaking mains. Soil-air penetrates dwellings because the air of buildings, being warmer than the surrounding soil, and warm air having a tendency to rise the air is drawn from the soil into the dwellings, and when this soil-air contains the deadly monoxide from illuminating gas fatal results may occur.

Configuration.—The position or configuration of the soil as well as its composition has much to do with health, the high well-drained lands being more healthful than the damp lowlands.

Certain disease germs are capable of living in the soil, and some of them, notably tetanus (lock-jaw), of multiplying in the soil.

From these facts we may readily see that the soil surrounding our dwellings should be kept free from decaying vegetable and animal matter, and that sewage and garbage should never be deposited

where they may produce foul air nor pollute wells, streams, or any water supply.

SEWAGE AND GARBAGE

Sewage is of two kinds, domestic and commercial. Domestic sewage is a mixture of waste from kitchen sinks, bath and laundry tubs, urine, feces and paper, while commercial sewage contains the waste from various industries, such as tanneries, dye works, oil refiners, etc.

Domestic sewage is liable to hold the discharges from infectious diseases which render it a menace to the public health, and while commercial sewage often contains large quantities of organic matter or chemicals destructive to fish-life, it is less harmful to human beings.

Removal of Sewage.—Two methods for the removal of sewage are in use, the wet and the dry. The wet method, that is by water, is familiar to most people, but the dry methods which are employed in the country and in very cold climates are less known.

To the average housewife the plumbing which carries away the sewage is of more importance than the ultimate disposal of the waste itself. Every woman should acquaint herself with the plumbing of her house, should know the plan of the system, the relation of the tributary pipes to the main soil

pipe, the kind of traps, their purpose and mechanism and whether every pipe, joint and trap is water-tight and in working order, and that every sink, tub, slop-hopper, basin and water-closet basin are as clean as soap and water can make them. Except for the occasional use of washing soda and boiling water to cut the grease and sediment in traps and pipes, the daily scrubbing and flushing, with care to prevent scraps of food and lint entering the drains, will be all that is necessary for good plumbing, which should last for years. Long-handled sanitary brushes for cleaning the water-closets are a necessity, their use preventing foul accumulations, which are the sole cause of bad odors.

The dry method of the disposal of sewage is accomplished by the use of buckets or pails to which are added, when used, layers of sand, or air-slaked lime, or land-plaster or sawdust. From the custom of the removal by night, this sewage has come to be known as night-soil and it is usually spread upon fields or gardens as a fertilizer; should quick-lime be used with this sewage it may not be a source of danger when it contains infectious discharges, but with a small amount of sand or other material unless properly covered with earth, it is open to house-flies and may contribute to the dissemination of typhoid fever and other infectious diseases.

The ordinary privy vaults commonly used in the smaller towns and the country need constant care.

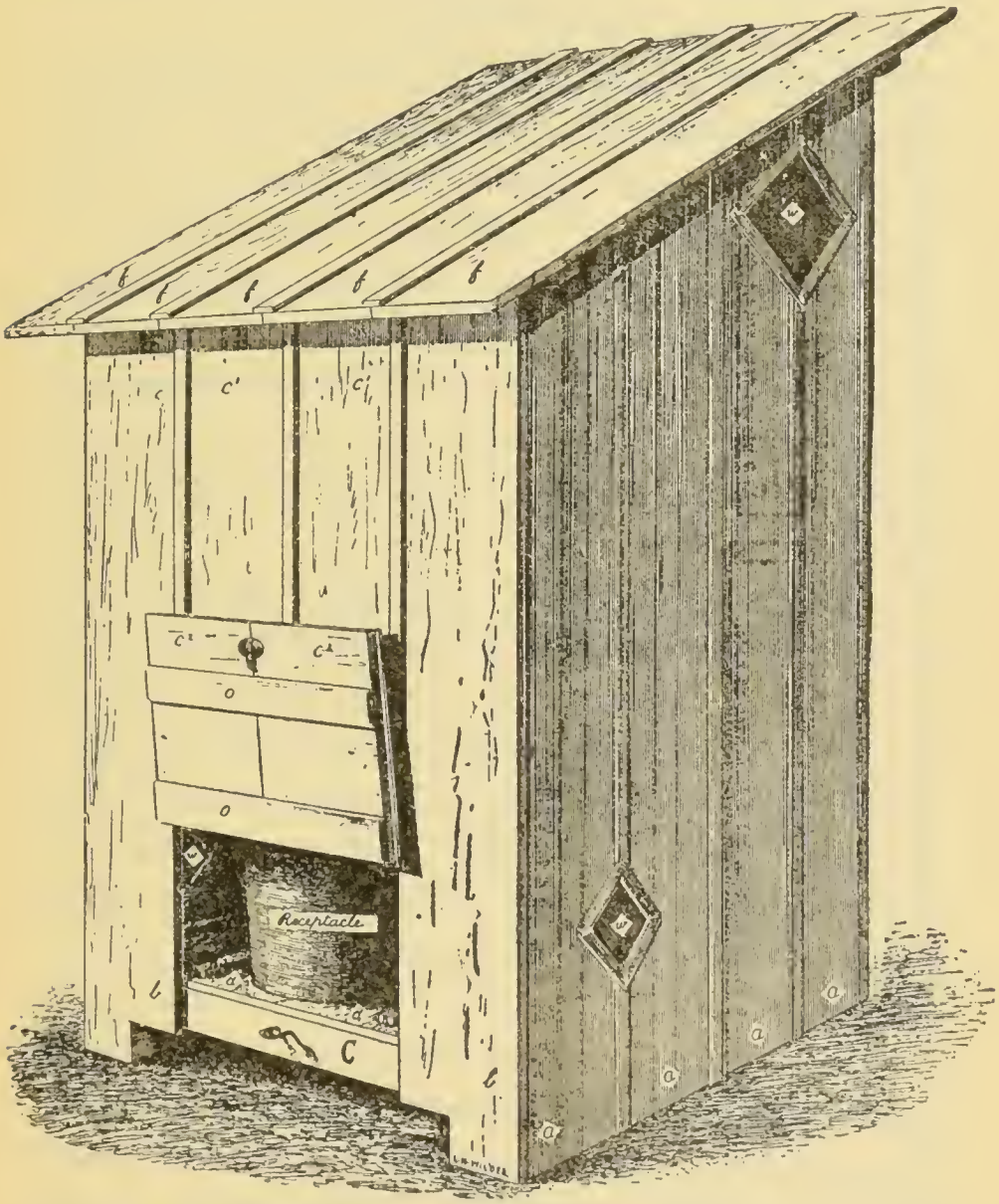


FIG. 9.—REAR AND SIDE VIEW OF A SINGLE-SEATED SANITARY PRIVY.
(*U. S. Public Health Service.*)

They should first be situated far enough away from the well to be safe from draining into the well, and there should be used daily a sufficient quantity of lime to prevent the breeding of flies in the vault. Anything more disgusting and dangerous than the thought of house-flies coming from a privy vault or barnyard into the milk or other food supply can hardly be imagined. The use of earth in a privy vault would be effective if enough were used daily, but the amount needed and the time to do it are often lacking, while a comparatively small amount of lime is much more effectual, as the chemical action of the lime does not permit the breeding of flies.

A simple inexpensive apparatus for the disposal of night-soil where no sewage system exists is described in Reprint from Public Health Reports No. 54, issued by the United States Treasury Department. The reprint describes in detail the materials and measurements and method of construction, and contains an excellent illustration, which would be easily followed by an ordinary workman.

A large majority of cities discharge their sewage into running streams, a revolting practice which in time will doubtless be prohibited. Sea-coast towns find the disposal of sewage an easy matter, as the elements of sea water cause a precipitate which

settles, and the tide dilutes and carries away the impure water.

GARBAGE

Garbage is the waste material from houses, shops, stables, factories, etc., and consists of kitchen refuse, ashes, sweepings, paper, old shoes and clothing, broken dishes, utensils, etc. In well-regulated cities kitchen refuse is kept separate from ashes and other dry rubbish. The prompt disposal of the accumulation of kitchen waste and stable refuse is one of great importance, as both attract flies; the kitchen refuse furnishes food for rats which spread bubonic plague. The stable litter is the most favorable breeding place for flies, while the decomposition of all accumulated waste causes foul odors.

In the country all kitchen refuse can be given to domestic animals, and bonfires easily dispose of inflammable material while broken utensils and tin cans should be buried. Old boards with nails, and broken dishes, particularly glassware, are extremely dangerous to the feet of children, adults and domestic animals.

In the country every particle of stable refuse, ashes and the contents of privy vaults can and should be carefully saved and returned to the soil as fertilizer.

Aside from being a menace to the health the heaps of rubbish are an offense to the eye If one judges of American housewives by the cleanliness of their back yards, we are forced to admit that the good ones are notable by their scarcity.

LESSON V

THE HOUSE

SUGGESTIONS FOR DEMONSTRATION

1. Show the effect of sunlight by two similar plants, one grown in the shade and the other in the sun.

2. Show samples of wallpaper in simple designs and soft tones compared with large, glaring patterns.

3. Show sample of bright colored wallpaper a portion of which has been faded by the sun, demonstrating how injurious coloring-matter may be thrown off into the atmosphere.

4. Show sample of furniture of good design, easily kept clean, compared with one elaborately carved and dusty.

5. Show illustrated catalogues of desirable and undesirable furnishings.

6. Show waterproof paper suitable for kitchen or bathroom, and a well-cared-for cooking utensil compared with one no longer fit to use.

7. Show a cracked, discolored china cup, and explain how germs may find a lodging-place in the crevices and be conveyed from one person to another.

The unit of civilization is said to be the family rather than the individual, and one of the essentials of family life is a well-chosen and carefully managed house. No matter what the standard of living, the homemaker should have an intelligent

understanding of the hygiene of the home and be able to determine whether the house and its surroundings are in a sanitary condition.

Location of House

Average city dwellers are more restricted in the choice of homes than those living in the country or in small towns, but they are, at the same time, more protected by municipal laws and regulations. Of paramount importance both to the city and country dweller are pure air, pure water, sunshine, and freedom from dampness.

Sunshine and *pure air* are not always easily obtained in large cities, and unfortunately many country dwellers seem to consider both pernicious intruders and carefully erect barriers against them. Who has not seen the country home set in a very paradise of green grass and flowers, with windows tightly closed and every ray of sunshine excluded by shades and shutters except in a remote wing occupied by the kitchen and work rooms? It is small wonder that the germs of disease, especially tuberculosis, find quite as fertile soil for development in such a home as in a crowded city tenement.

In selecting or building a house certain points should be carefully considered:

1. Is the location a desirable one?

2. Is the house built on an elevation or on well-drained soil?

3. Are there swamp lands near?

4. Are there stables, drains, cesspools, or privy vaults within 200 feet of the house?

5. Is there an ample and pure water supply?

6. Are there large trees near enough to make the house damp?

A southern exposure is considered desirable, but if the house stands with its corners to the points of the compass all rooms will have sunshine during a part of the day. If the house is to be occupied during the winter months there should be some protection from cold winds, and a general slope of the ground to the south adds to the warmth and comfort.

General Arrangement of Rooms

Rooms most frequently used should be placed on the sunny side of the house, for sunshine is as necessary for people as for plants. Sleeping rooms should be, preferably, on the second floor, with eastern or southern exposure. Special thought should be given to the relation of the kitchen to storerooms, pantry, cellar, and dining room, in order to simplify work and save steps.

Cellar

The cellar or basement should extend under the

whole house, or there should be a well-ventilated air-space where there is no cellar. The walls should be built far enough above the surface of the ground to give light and ventilation, and should be as nearly as possible impervious to moisture. There should be windows on all sides, or at least on two opposite sides. The floor should be dry and covered with cement. If the cellar contains a furnace the partitions, if any, should be of brick, stone or fireproof material, and the coal bin conveniently located. The furnace should be large enough to heat the house easily, and if of the hot-air type should have a tight, well-fitting "cold air box," so arranged that it can be cleaned throughout its entire length. It should communicate directly with the outside air, well above the ground, and the outer opening covered with fine wire or cheese-cloth to prevent dust and leaves from being drawn into the flue. It must be remembered that the same air which is supplied to a furnace of this character is, when heated, distributed through the house.

The cellar should also contain a cold room for the storage of food, but it is most undesirable that large quantities of fruit or vegetables should be kept in the house cellar. If, however, this is unavoidable, there should be a special room for the purpose, with an outside door.

Rooms

The number and size of rooms will depend upon the needs and means of the family. Each room should be suitable for its purpose, and as beautiful as can be afforded. Every member of the family is entitled to some privacy, which can be secured most easily by separate bed-rooms. These must not, however, be too small, insufficiently lighted or poorly ventilated. The well-established rule of 1000 cubic feet of air space for each individual is a safe guide.

Kitchen.—From the standpoint of health the kitchen is the most important room in the house, for it is really a laboratory in which chemical changes are going on and chemical compounds being formed, either intelligently or carelessly, in the production of food. The health of the family is a fairly sure index of the methods employed in the home kitchen. This room should be one of the brightest and most airy in the whole house, conveniently arranged and easily kept clean. Floors should be of hard wood, oiled or well painted and varnished. The wood work should be plain and the walls painted or covered with waterproof paper which can be washed. Kitchen closets and store-rooms should have outside windows if possible, and ample openings so that all parts can be easily seen and kept clean. There should be neither

cracks nor crevices in wall or floor, no dark corners or out-of-the-way cupboards in which dust, food particles and moisture can accumulate. Such conditions not only attract mice and roaches, but furnish a favorable soil for the development of bacteria.

Stairs

Stairs should be well lighted and conveniently located, the steps broad and easy to mount. It is also a convenience in moving trunks and heavy furniture if there is an extra wide stairway with no turns.

Bathrooms

Bathrooms should be well lighted, well ventilated, with sanitary furnishings and fixtures which can be easily kept clean.

Porches

The size, arrangement and number of porches will depend upon the climate and whether the house is to be used during the whole year. Porches which would be acceptable in a very warm climate or for a summer house would be quite unsuitable under other circumstances. Porches should not be wide enough to darken a house which is to be used in the winter. Sunshine saves the coal bill as well as the doctor's fee. A small porch opening from

the kitchen, if screened, makes an ideal summer dining-room. Upper porches may be used as sleeping rooms and are quite as desirable for well people as for invalids. In most localities they will need screening.

Screens

Could all the surroundings of the house be absolutely controlled we might prevent the development of flies and mosquitos, thus making the use of screens unnecessary. This is not possible, however, and knowing that only through the mosquito can malaria be acquired, and that the common house-fly is a menace to health, we find it essential to protect ourselves by means of screens. To be effectual, this protection must be complete and include all parts of the house which are occupied. Screens should be made from wire netting, preferably bronze, not less than 16 wires to the inch, well fitted and unbroken. They should be put in place before the flies and mosquitos begin to appear and not removed until all danger of them has passed. It is better to have the whole window screened, and most important in the kitchen, in order that the windows may be opened at the top and bottom.

Closets

Ample closet room adds much to the convenience and order of the home, but is often sacrificed by

the builder. Outside windows are desirable but not often possible. A muslin curtain may be used to cover the opening, but if there is a door it should be large in order that all parts of the closet may be aired.

Windows

Each room should have a sufficient number of windows to light all parts of it, and they should be so placed, either in relation to each other or to doors, as to give cross ventilation. Windows should not, however, be placed directly opposite each other, as such an arrangement makes drafts without allowing the fresh air to mix with that of the room, and the cross-rays of light are trying to the eyes. All windows should open easily, both at the top and bottom. Furniture should be so placed that when reading, writing or using the eyes for close work the light falls from the left, thus avoiding shadows.

Built-in Fixtures

China closets, bookcases and cupboards are often an economy, as they save the purchase and expense of moving heavy furniture, but they should be well built and added after the house has been plastered. Cupboards and closets should never be built around plumbing, under kitchen sinks, or bath-room basins.

Refrigerators and Ice-boxes

These are seldom built-in fixtures, but an outside door can easily be arranged for the delivery of ice. The waste pipe should not be connected with the house drain, but is sometimes placed over a well-trapped drain, separated from the refrigerator waste-pipe by a generous air space. The ordinary drip pan is probably safer, but requires considerable care.

Furnishings

It has been said that all the contents of a house which are neither useful nor beautiful should be discarded. Numerous pieces of furniture, bric-a-brac and draperies which serve no useful purpose are wearying to the eye and add greatly to the burden of housekeeping. Furniture, draperies and carpets may be detrimental to health by excluding light and air and accumulating dust. The amount of money spent in furnishing the home bears but little relation to the comfort and happiness of its inmates. In the selection of furnishings two points should be considered—utility and beauty. In the average household, where no servant is kept, utility must be the first consideration; but this need not prevent the selection of an article which is also pleasing to the eye. Bed-room furnishings should be simple, and draperies which can be laundered are most suitable.

Floors

Floors should be of hard wood, tightly joined and finished at the baseboard by a quarter round. If softwood floors are used, they should be stained or painted and well varnished. Bath-room floors should be preferably of tiling or cement.

Woodwork

Elaborate mouldings and projections make lodging places for dust and should be avoided unless there is ample help to keep such woodwork clean. Many woods are beautiful in coloring and may be simply oiled, but if necessary to use a less expensive wood it may be painted white. It is difficult to secure a white paint which is not injured by washing, but it has the advantage of giving ample warning when it is soiled and can be easily renewed. White enamel is expensive but makes an excellent covering for soft wood.

Wall Finish

Painted ceilings and walls are without doubt the most hygienic, but they are more expensive than paper and give less choice in color and design. There can be no great objection to the use of wallpaper in the well-cared-for home, but it should be promptly changed when soiled and all the old paper removed. Wallpaper should be simple in design

and cheerful in color. Soft shades of yellow, or reddish yellow, are most suitable for rooms having little sunlight, and dull greens are restful in exceedingly bright rooms. Wall coverings for bedrooms should be selected with great care and preference given to small designs and soft tones. Large glaring figures are often most trying, especially in case of illness.

Arsenic is sometimes used in the coloring of wallpapers, especially in vivid greens and reds, and instances of arsenic poisoning have been traced to the use of such papers. Colors which do not readily fade are less likely to contain arsenic.

Furniture

Substantial, well-made furniture of simple design is more suitable for the average home and far more beautiful than the machine-carved pieces usually found in shops. It requires constant care to keep elaborately carved furniture clean, and unless of excellent quality it soon gets out of repair. Upholstered furniture should not be purchased unless one can afford a good quality and have it recovered when soiled.

Floor Coverings

Carpets and mattings which are not easily removed are difficult to keep clean and should find

no place in the modern home unless we are willing to adopt the Japanese custom of changing our shoes before entering the house. Rugs are the most cleanly floor covering, but should be heavy enough to keep in place. One or two good rugs placed where they are most needed are better than several small ones over which people are liable to stumble.

Draperies

Draperies and curtains should be so hung that they can be removed without difficulty. Simple muslin curtains which can be regularly laundered are always in good taste and much better than cheap imitations of lace. Too many draperies over windows should be avoided as they exclude both light and air. Inexpensive portieres are seldom beautiful and less frequently clean.

Table Linen

A well-appointed table adds much to the pleasure of a meal and might even be said to indirectly promote good digestion. Table linen should be of as good a quality as one can afford, but in the home of moderate means inexpensive doilies which can be easily laundered may be substituted for table cloths. A napkin should be provided for each member of the family, and some means of identification devised.

Beds and Bedding

Rest and sleep are essential to health, and the care and quality of beds and bedding are important factors in securing them. Even though inexpensive, the bed should be comfortable, springs firm, and mattress in good condition. A slip cover or quilted pad which can be laundered should be used to protect the mattress, and unless the so-called "box springs" are used there should be some protection over wire springs to keep the mattress clean and prevent its rusting. Sheets should be ample in width and long enough to tuck well under the mattress at the foot and turn over ten or twelve inches at the top to protect the blankets. The quality and kind of blankets and bed-covering will depend upon the family means, but it is most important that blankets be kept scrupulously clean, those containing part cotton being less easily injured by washing.

The outer covering of the bed is of course a matter of taste, but white dimity counterpanes are light, cleanly and easily adjusted. They are especially satisfactory in case of sickness as they are easily laundered and add but little to the weight of the bed-covers.

Towels and Washcloths

Towels and washcloths should be provided for each member of the family and under no circumstances should these articles be used in common, as serious infections may be conveyed in this way.

LESSON VI

CARE OF THE HOUSE.—THE LAUNDRY

SUGGESTIONS FOR DEMONSTRATION

1. Show sample of sour milk with mold on surface, and any decayed food to illustrate the action of bacteria.
2. Show clean and unclean dish cloths and tea towels.
3. Demonstrate dusting with a damp cloth.
4. Demonstrate the removal of stains from table and bed linen.

Care of the House.—A house must receive proper care or it soon becomes uninhabitable, no matter how much thought has been given to its location, construction and furnishing, while system in the daily routine of work is quite as essential in the home as in the factory, hospital or workshop. A house given proper daily and weekly care will not need to be absolutely overturned semi-annually to the discomfort of all concerned. Each day should have its special duties and a written list of these may be kept as a reminder, while each member of the household should have definite responsibilities. The division of work and the amount required of each will naturally depend upon the size of the

family and the mode of living. Children should early be taught to share in the care of the home, that habits of order and cleanliness may be developed.

Repairs.—All parts of the house should be frequently inspected and needed repairs promptly made, not only as a sanitary measure, but as a matter of economy.

Care of the Cellar.—We must remember that the air of the cellar is drawn through the whole house and make every effort to prevent its contamination. Old boxes, boards and trash should not be allowed to accumulate, for they add greatly to the labor of keeping the cellar clean and free from dust and the air of the house pure. Ceilings and walls should be frequently brushed and kept free from cobwebs and dirt. Walls should be whitewashed twice a year, and windows, well screened, kept open to insure a free circulation of air. During very hot weather the cellar may be kept cool and dry by opening the windows at night and closing them during the day. If the temperature out-of-doors is much higher than that in the cellar it causes condensation of moisture on the walls and makes the cellar damp. Decaying fruit or vegetables should be removed at once and any unpleasant odor promptly investigated.

Rats and Mice.—Besides being destructive, rats and mice may carry disease and all buildings should

be proof against them. As they usually gain entrance through the cellar, solid walls, cement floors and carefully screened windows are the only sure protection. Food and garbage must never be left within their reach and all rat or mouse holes should be filled with broken glass or crockery and closed with cement. If, however, rats or mice are known to be in the house, traps and poisons may be used and the family cat or dog pressed into service. Poisons must be used with great care, as they are quite as dangerous to children and household pets as to rats and mice.*

Care of Kitchen.—In no portion of the house is eternal vigilance so necessary as in the room set apart for the storage and preparation of food. Unfortunately bacteria thrive on the very substances needed for our own nourishment and the warmth and moisture found in a kitchen complete the conditions necessary for their growth. Their action has long been recognized in the souring of milk, the putrefaction of meat and the rotting of fruits and vegetables, but we are now beginning to learn how to protect ourselves against them. We know that their development is restricted by very definite conditions as to moisture and heat—that a substance must contain more than 25 per cent of

* See list of publications. United States Public Health Service Appendix, page 227–231.

water and that the most favorable temperature for their growth is from 80° to 95° F. We must, therefore, wage a constant warfare to make the conditions unfavorable—*this is good housekeeping*. In cleaning kitchen tables and woodwork water should not be allowed to soak into cracks and dark corners where it cannot be reached, for it will carry with it particles of food for the nourishment of bacteria and insects, and if the floor is covered with linoleum the edges should be well fitted to prevent water running underneath.

Kitchen windows should be screened and kept open at the top and bottom, while a properly ventilated hood over the range will help to carry away the odors of cooking.

Sinks and Drains.—Porcelain sinks can usually be kept clean with hot soapsuds and stains can be removed by rubbing with kerosene oil or benzine. Acids must never be used on porcelain or marble as they roughen the surface and form lodging places for dirt. Sinks and drains should be well flushed with boiling water and washing soda to prevent the accumulation of grease in traps and pipes. Iron sinks are more difficult to keep clean than porcelain and for these caustic potash may be used. This is also excellent for the traps and drains for it unites with the grease to form a cleansing soft soap, but it

must be remembered that potash is a corrosive poison.

Care of Utensils.—All cooking utensils should be thoroughly washed, scalded and dried before putting them away, for not only is the use of carelessly washed dishes unwholesome, but they are almost certain to ruin the flavor of food cooked in them. Enameled or agateware which has begun to chip should be discarded and cracked dishes should not be used unless for the storage of dry articles. Iron and steel utensils which are rusted may be cleaned by the application of some fat, such as lard or oil, well covered with powdered quicklime. After standing a day or two the rust, if not too deep, will disappear when the article is washed, but if necessary the process may be repeated. Dish-cloths and tea towels should be washed and boiled after using and if possible dried in the sun.

Care of Refrigerator.—No matter how carefully a refrigerator may be constructed the interior will be more or less damp—a condition we know to be favorable to the growth of bacteria—and for this reason we must keep the temperature as low as possible by a plentiful supply of ice. The door should be opened only when necessary and promptly closed. Ice should be washed under running water before being placed in the refrigerator, and if wrapped in paper will melt less rapidly and any

particles of dirt contained in the ice may be taken out with the paper.

Food should be removed at once if it shows the slightest sign of putrefaction or mold, and the refrigerator should be entirely emptied and well cleaned at least once a week. The drainage pan should be frequently washed and scalded. The racks should be thoroughly washed in hot soapsuds, to which a small amount of washing soda has been added, rinsed in boiling water, dried and placed in the sun and air while the refrigerator is being cleaned. All parts of the refrigerator should be washed in the same manner, giving special attention to grooves and projections where food or dirt may have lodged. Rinse in boiling water and soda, flushing the drain pipe, and rinse again with plain hot water. The interior should be thoroughly dried with a clean cloth and left to air for at least an hour. The linings should be watertight and drain freely open at all times, otherwise the surrounding wood will become foul and saturated with drainings.

The Care of Plumbing and Disposal of Garbage.—These subjects have been dealt with in a previous lesson, but the necessity of absolute cleanliness in the care of plumbing and the prompt disposal of garbage may again be emphasized. Plumbing should be regularly inspected, for while it is one of

the greatest of conveniences it may also be a source of much anxiety and if out of order or not properly cared for may become a positive danger. If coal is used in the kitchen range much dry waste can be burned, but if garbage must be kept, as in the city, until called for, a watertight covered garbage can should be used and washed each time it is emptied. Fresh chlorid of lime may be sprinkled in the can, or it may be rinsed in carbolic solution one teaspoonful to a quart of hot water.

Care of Bed-rooms.—Even in health more than a third of one's life is spent in the bed-room and in sickness its four walls become the boundary of existence. Bed-rooms should be made restful to mind and body alike and kept scrupulously clean. Windows should be open at night, using a screen covered with washable material, if needed for protection from drafts and light. In the morning if windows have been closed while dressing they should be opened again before leaving the room and the covering of the bed and pillows removed and placed near them to air. Mattress should not only be turned daily but reversed in order that it may wear evenly. Bed frame and spring should be kept free from dust and nothing placed under the bed. In a small apartment or room there is a temptation to utilize the space under the bed for the storage of boxes or small trunks, but they make

lodging-places for dust and add much to the labor of keeping a room clean.

Gas Fixtures.—Gas fixtures must be kept in a perfect condition, the slightest odor of gas investigated and the leak promptly repaired. The key should be guarded by a projection which prevents turning it beyond a certain point, for otherwise it is difficult to know whether the gas is turned off or on and doubtless many deaths have been due to such defective gas fixtures.

Care of Floors.—Hardwood floors and those which have been painted and varnished can easily be kept clean if polished regularly, but the secret of success is to secure a firm hard surface in the beginning and to keep the floors in good condition by frequent rubbings and renewal of polish when necessary. Most housekeepers have a favorite method of polishing floors, which can only be judged by the result, but the use of too much wax should be avoided as it makes the floor sticky and collects dust. Soap should not be used on a polished floor but it may be wiped occasionally with a damp cloth if well rubbed afterward. Soiled or dark spots can usually be removed with crude petroleum or turpentine, but after its use the place will need polishing. An ideal method of sweeping floors is by means of a vacuum cleaner which removes dust by suction, but if floor brushes are kept clean, or

better still covered with a soft cloth which can be washed after using, floors may be swept without raising any appreciable amount of dust.

Suggestion for the Weekly Cleaning of a Room.—Rugs and draperies should be taken out-of-doors, if possible, brushed or beaten and left to air while the room is being cleaned. In the city, where this is out of the question, the contents of the room, including draperies, should be dusted and removed to an adjoining room or covered before sweeping.

Radiators and Registers.—Radiators should be dusted with a narrow brush or if there are registers in the floor they should be taken up and cleaned, dust removed from hot-air pipes and covered while sweeping.

The ceiling, lighting fixtures and picture moulding should next be brushed. During the cleaning of a room the doors should be kept closed and all windows open.

Carpet or rugs should be swept with a stiff broom, taking up the dirt frequently. A soft brush or dust mop should be used for the removal of dust from the floor.

Pictures and walls should be brushed or wiped with a soft cloth, always working from the upper part of the room down.

Woodwork should be wiped at the same time and any soiled spots removed. Turpentine followed

by a vigorous rubbing with oil may be used for natural wood, but if painted or varnished a thick cream of whiting or Bon Ami is better.

Windows should be opened top and bottom, well brushed both inside and out and woodwork cleaned if necessary. Glass may be polished with cream of whiting or Bon Ami. Special attention should be given to the ledges over the doors and windows and the tops of doors and baseboard. A damp cloth is excellent for this purpose, but must be used with care to avoid soiling the paper. The floor should be well rubbed or polished with a weighted brush before replacing furniture and draperies.

Sweepings should be collected in paper bags or securely wrapped in paper and burned if possible, while dusting should be done, preferably, with a damp cloth frequently rinsed in clean water.

A special rug or cushion should be provided for dog or cat and they should be taught to use only their own. Even with the best of care both cats and dogs are liable to have fleas, and rugs, baskets or cushions used by them should be brushed and aired daily.

Directions for Cleaning a Room which has been Occupied by a Patient Having a Contagious Disease.—Definite instructions concerning fumigation and the care of articles which cannot be laundered will usually be given by the family physician, or in

cities the responsibility will rest upon the Board of Health. Of equal importance however is the general cleaning which should follow the fumigation and it is most important that this be done intelligently and thoroughly.

The following outline of procedure is given by Dr. Abbott ("Hygiene of Transmissible Diseases"):

"There is as yet no single procedure by which every article in an ordinarily furnished infected room may be simultaneously and certainly disinfected.

"It is always advisable, therefore, where circumstances permit, to have but little unnecessary furniture, hangings, carpets, etc., in rooms occupied by the sick. For rendering rooms that have been occupied by persons suffering from contagious diseases free from danger, the most trustworthy plan consists in a combination of the best features of several methods that have been from time to time proposed.

"The steps to be taken are briefly as follows: After the room has been vacated by the patient, all conspicuous cracks and crevices should be sealed, the door should be closed and locked, and the room kept closed for at least twenty-four hours. At the end of this time formaldehyde gas should be either generated in the room by the decomposition by heat of from 50 to 75 tablets of polymerized formaldehyde to each 1000 cu. ft. of air-space, or formaldehyde gas generated from its watery solu-

tion by an approved apparatus may be passed into the room from without. The amount of gas employed should be that given off from at least 1 pound of formalin or formochloral for each 1000 to 1200 cu. ft. of air-space."

(*Author's note:* This fumigation could not, however, be done except under the direction of a physician.)

"After this the room should be kept closed for at least six hours. This accomplishes the necessary disinfection of all surfaces.

"The room may then be entered and all bedclothing, pillows, mattresses, other clothing in closets, chests, trunks, etc., should be put into canvas bags, brought for the purpose by the operators, and sent at once to a disinfecting station, where they are subjected to the action of steam. This completes the disinfection of those articles that were only superficially acted upon by the formaldehyde gas.

"In the meantime the ceiling and walls are to be wiped down with cloths wrung out in 3 per cent. carbolic acid, 1 : 2000 corrosive sublimate, or 0.5 per cent. chloride of lime solution; and finally, all furniture and all horizontal surfaces, such as window-sills, cornices, etc., are to be similarly wiped off, after which the floor is to be scrubbed with hot soda solution of about 4 per cent. strength.

"In the case of hangings, valuable curtains, tapestries, carpets, etc., that might be injured by steam disinfection, it is best to remove them after the action of the formaldehyde and have them

thoroughly beaten or shaken on some distant open lot, after which they should be freely exposed to direct sunlight.

"The object of each of these steps is:

"The keeping of the room closed for a day after its vacation permits all dust to settle.

"The generation of formaldehyde gas in the room disinfects the dust and all exposed surfaces, so that there is danger neither to the operators themselves nor of their conveying infective matters.

"The wiping of walls, furniture, and surfaces, and the scrubbing of the floors with disinfecting solutions insure the destruction of infective matters that may have escaped the action of the formaldehyde gas.

"The steaming of pillows, mattresses, bedclothing, etc., insures the destruction of infective matters that may have soaked into their deeper layers and escaped the action of the formaldehyde gas.

"When a room has been disinfected and cleaned by the process outlined above, it should be thoroughly aired for a few days before it is occupied.

"On closing the room preparatory to its disinfection the nurse or attendant whose duties it has been to seal up all cracks and crevices, before leaving should doff her over-slip and overshoes and leave them in the room to be disinfected with the other articles."

LAUNDRY

The care and washing of soiled clothes concern the health of the family and the community far

more than is generally realized. While it is not the purpose of this lesson to take up the details of laundry work there are certain general principles which may properly be considered questions of hygiene.

Care of Soiled Clothes

Soiled clothes should not be stored in bed-rooms or closets, but kept in a covered hamper or washable bag in bathroom, unused hall or laundry, and washed weekly. Damp towels and garments should be thoroughly dried before putting them with other soiled clothing. Table linen, tea towels, etc., should be kept separate.

Laundry tubs and all washing utensils should be kept clean and boiler free from rust.

Clothes-pins should be kept in a clean bag and discarded when they become soiled or discolored.

Clothes-line.—If a hemp or cotton line is used it should be taken down when clothes are dry and protected from dust and dirt. If the clothes line is wire it should be wiped with a damp cloth before using.

Public Laundries

If a public laundry must be patronized the place should be inspected and the methods of washing ascertained. It is most desirable that the clothing of each family be kept separate, and everything

should be boiled for at least ten minutes, when this can be done without injury. This is especially important for bed linen, body linen and towels, and should be insisted upon. After clothes have been properly washed, boiled and dried, they should be kept clean during the finishing process. Many laundries are careless in this regard and clean clothes are left standing around exposed to dust and dirt, or even in actual contact with clothing not yet laundered. Unless conducted in a sanitary manner a public laundry may be a source of real danger, for some contagious diseases, notably those of specific origin, may be conveyed by improperly washed clothing.

Large laundries seldom have facilities for drying clothes out-of-doors, and while steam driers may be more sanitary in cities where the air contains more or less dust and impurities, there is such an unmistakable sweetness and freshness about clothes exposed to pure air and sunshine that whenever possible one should take advantage of these natural disinfectants.

Water

One of the first essentials in the removal of dirt from clothing is a good supply of soft water. Water is said to be hard when it contains an excess of mineral salts such as carbonate of lime (chalk) or

sulphate of lime (gypsum). Unless measures are taken to counteract this hardness the soap forms a useless, insoluble compound which floats on the surface of the water. Hard water may be softened by exposure to the air, by boiling, or more surely by the addition of an alkali. Washing soda, one ounce to each gallon of water (or less if water is not very hard), is commonly used, but an equal amount of borax answers the same purpose, and while more expensive is less injurious to clothes and hands. Both washing soda and borax should be well dissolved in boiling water before using. Commercial washing powders will also soften water but their use should be discouraged for they are almost certain to injure the clothing. If water is muddy or discolored a tablespoonful of powdered alum dissolved in hot water and added, will precipitate the impurities. Household ammonia will soften water and is excellent for washing flannel. Use ½ tablespoonful to each gallon of water. If water is too hot the ammonia will evaporate.

Soaps

Hard soap is made from a mixture of caustic soda and fats, and soft soap from a mixture of caustic potash and fats. Almost any hard soap is suitable for general laundry work, but a soap containing potash while a better solvent is injurious to

fabrics and should be used only for the heaviest and coarsest of garments.

There is a great diversity of opinion in regard to the best method of laundry work, but the important point is the removal of dirt with the least possible injury to the garment.

Care and treatment of soiled clothes in case of sickness vary somewhat, depending upon the nature of the illness, and whether or not the disease is contagious. If wet or stained, they should be washed at once or placed in cold water.

Removal of Stains

All stains should be removed before washing.

Blood-stains.—Rinse repeatedly in cold water, then rub well in tepid soapsuds. Naphtha soap is excellent for this purpose. If this is not sufficient to remove stains, cover with cold, raw starch let stand for a time, and wash in cold water. Repeat the application if necessary.

Iodine and Other Medicine Stains.—If fresh they can usually be removed with naphtha soap and warm water, but if dried the stain should be dissolved with alcohol, ether or chloroform before washing.

Iron Rust.—If garment is uncolored use dilute hydrochloric acid and rinse in water to which a small amount of ammonia or borax has been added

Lemon-juice and salt are sometimes sufficient to remove iron rust.

Fruit stains can usually be removed with boiling water.

Care of clothes which have been used for a patient with a contagious disease

The following directions are given by Abbott:

"The body and bed clothing of the patient should be removed with as little agitation and commotion as possible, and at once immersed in a solution of

Carbolic acid	3 parts
Common soft soap	2 parts
Cold water	100 parts

contained in a covered vessel that is *brought to the bedside*. As soon as the objects are thoroughly saturated with the solution the cover is replaced and they are allowed to soak for two hours, when they may be rinsed out in clean water and subjected to the ordinary processes of the laundry beginning preferably with boiling.

"The reason for the immersion in the cold carbolic soap solution is that this not only destroys all non-spore-bearing bacteria, but in the cold state dissolves out all blood and fecal stains which would be rendered indelible if the soiled articles were exposed at once to steam or boiling water.

"Chloride of lime in 0.5 per cent. cold water solution may be substituted for the above mixture, but as it has some bleaching effect it had better be used only on white clothing."

Washing soda or borax may be added to the water in which the clothes are boiled.

Handkerchiefs which have been used by persons suffering from influenza or cold should not be mixed with other clothing but placed in a basin or small boiler of cold water to which a tablespoonful of salt has been added; bring slowly to the boiling point and boil for ten minutes. After boiling and rinsing they may be washed with other clothing.

In cases of diphtheria, tuberculosis or any disease where there are offensive discharges old pieces of muslin, gauze or paper handkerchiefs should be used instead of linen handkerchiefs. These should be collected in paper bags or wrapped tightly in paper and burned at once.

LESSON VII

PERSONAL HYGIENE

PUBLIC AGENCIES CONCERNING HEALTH AND WELFARE

SUGGESTIONS FOR DEMONSTRATION

1. Demonstrate proper and improper habits of breathing.
2. Show right and wrong postures, especially in school children.
3. Show right way of scrubbing the hands.

In order to enjoy good health, certain rules and regulations of living are necessary. These rules should be no hardship, but merely observation of a few general principles mixed with some common sense. *Cleanliness* is our main defense against contagion, hence the regular daily bath is not only a measure for removing dirt and of refreshing us, but is an important aid in keeping us well. The bath may be hot or cold. Cold baths are stimulating to many, but there are persons, particularly as they grow older, who cannot stand cold baths. The care of the hands is especially important as we are constantly touching things in common

with others and then we touch our food, our dishes, our table napkins, our tooth-brushes, our handkerchiefs, etc., therefore our hands need frequent scrubbing, not dipping, and especially before meals, and after visits to the toilet room. The nails should be kept rather short, and some cold cream or other emollient should be used to keep the skin smooth and free from cracks and chapping. It is impossible to scrub the hands if they are chapped and tender, and on the contrary nothing causes chapping as quickly as dirt.

The hair should have frequent washings: its oil in combination with dust and soot, and perhaps infective materials, can only be removed by the use of plenty of soap and water.

The eyes are often subjected to neglect, instead of respecting their marvelous mechanism and taking care of them properly. Children should be taught with their first books to let the light—either natural or artificial—shine on the book, not into their eyes. Children who scowl in most instances do so from some defect of the eyes. Many near-sighted children have been thought dull when in reality they could not see what was going on around them. Any defects of vision, inflammation and swelling of the lids should have medical care—the eyes and ears are too valuable to be tampered with by home treatment. Headache always accompanies

eye-strain, and besides headache, long-continued eye strain causes nervous disturbances, as indigestion, insomnia and nervous irritability. The eyes should be washed daily with clean lukewarm water. A teaspoonful of salt added to a pint of warm water for bathing the eyes, allays the tired "sandy" feeling after close work as reading, writing or sewing. In wiping the eyes "pat" them dry; do not rub and "dig" into them. When glasses are worn they should be washed daily in lukewarm water with a little soap, rinsed and wiped with an old soft handkerchief; they should not be held by the lens, but by the frame and should be frequently straightened and adjusted by the optician.

The teeth should have special daily care and be inspected by the dentist at least twice a year. The tartar upon the teeth is a deposit of both mineral and animal matter from the saliva which should be removed by the dentist at regular intervals as it forces the gums away from the teeth and eventually causes them to fall out; tartar also vitiates the saliva and deranges the digestion as well as causing a bad odor to the breath. Decayed and suppurating teeth afford breeding places for bacteria as well as interfering with the proper mastication of food, which in turn causes disorders of digestion.

The nose too needs proper care. Douching and spraying the nose should not be done except under

the advice of the doctor, and obstructions of the air-passages in children, as before mentioned, should have early treatment. Handkerchiefs should be clean and abundant. The nasal discharges, even from common colds, are a source of danger to other persons and of re-infection to the patient, and there seems to be no doubt that in diphtheria, scarlet fever, measles and tuberculosis the nasal and throat discharges are the chief sources of infection, hence the necessity for an abundance of clean handkerchiefs.

Feet.—Except the stomach, probably no part of the human body is more abused and neglected than the feet. Improper and ill-fitting shoes contribute to the deformities so commonly seen; the word deformity is used advisedly, because a normal foot is almost unknown; ingrowing nails, overlapping toes, hammer toes or broken-down arches are common defects. A child's foot is shapely and smooth, but the feet of most adults are anything but shapely, besides causing their owners to walk with an awkward gait. Comfortable well-fitting shoes and stockings, cleanliness and carefully trimmed nails would prevent two-thirds of foot troubles and the remaining one-third should be referred to the doctor.

Diet.—A suitable diet may be defined as one which supplies the material necessary for the growth and repair of the body, which maintains its normal temperature and gives energy and strength for the

performance of the daily routine. As the requirements of the body are modified by age, sex, climate, season and condition of health the character and amount of food necessary for the individual must be largely a question of personal judgment and experience. A healthy adult requires a mixed diet, but the process of digestion is simplified if a limited variety of food is taken at each meal.

Amount of Food.—The amount of vegetable food, including starches and sugar, taken in twenty-four hours should be at least double the amount of animal food, including all forms of fats and oils. The total amount of food may well be decreased in hot weather and the proportion of vegetable foods increased. Some vegetables, such as peas, beans and nuts may be substituted for meat. Many tables have been compiled showing the proportion of animal and vegetable foods needed under various conditions.

The following, given by Parkes, is comprehensive and suggestive, as it shows the amount of food per diem needed by an adult at rest and the maximum for those engaged in laborious occupation.

	In Laborious Occupation	At Rest
Nitrogenous substances, *e. g.*, flesh	6.0 to 7.0 oz. average	2.5 oz. average
Fats (oils)	3.5 to 4.5 " "	1.0 " "
Carbohydrates	16.0 to 18.0 " "	12.0 " "
Salts	1.2 to 1.5 " "	0.5 " "
Total	26.7 to 31.0 " "	16.0 " "

Water.—Nearly three-fourths of the total weight is made up of water and it is of the utmost importance that a sufficient quantity be taken regularly. It has been estimated that an adult of average weight requires from 80 to 90 oz. of water in twenty-four hours. About 20 oz. of this amount forms a part of the solid food leaving not far from two quarts to be taken in the form of liquids—water, tea, coffee, etc. At least a glassful of water should be taken before breakfast, an equal amount in the middle of the forenoon and afternoon and again on retiring. If water is taken regularly at these hours there will be but little danger of overdrinking at mealtime.

Number of Meals.—Three meals a day are sufficient for a healthy adult as the stomach needs an interval of rest. The chief meal—dinner—should be taken at an hour most likely to be free from worry and anxiety with the possibility of a period of quiet afterwards. Unpleasant topics of conversation, discussion and argument should be avoided at table, for there is no doubt that the mind reacts on the processes of the body and may seriously interfere with digestion. The length of time spent at meals must depend upon circumstances, but the habit of hurried eating should be discouraged. All foods containing starch and sugar should be thoroughly masticated and mixed with saliva.

The Use of Tea and Coffee.—There is much difference of opinion in regard to the use of tea and coffee, but when properly prepared, without boiling, there can be but little objection to their moderate use by healthy adults. The custom of taking tea in the afternoon, instead of with a hearty meal, is a rational one, as the mixture of tea with a quantity of food, especially of starches, may retard digestion.

Excretions.—The four sources of the excretion of waste from the body are the skin, the lungs, the kidneys and the bowels, and upon their regularity largely depends our state of health. The retention of these different forms of waste in the body acts as poison. The lungs should be furnished with pure air and the individual should breathe deeply to keep up the supply and to exhale the impurities. Bathing stimulates the action of the skin as well as removing the sweat and débris. The movements of the bowels are regulated greatly by the nature of the food taken, as well as upon the occupation and exercise, but at least one movement daily is an absolute necessity to every adult or the accumulation of fecal matter is re-absorbed and productive of disease. Most of the muddy, pimply complexions are caused by constipation. An adult should take at least three pints of fluid daily to flush the kidneys and to dilute the waste.

Sleep should be regular. Much insomnia in

adults results from irregular habits of sleeping when children. If all children from infancy to twelve years were obliged to go to bed at a regular hour the good habit would be formed for life. One of the bad habits of mothers and home nurses is the pride of going without sleep while caring for the sick. No more mistaken idea of devotion could be contrived. No human being who has been over twenty hours without sleep is in any condition to carry out orders for the sick. It was for this reason that many States have passed stringent laws forbidding railway employees being on duty over a certain number of hours. Any person caring for the sick should have every faculty awake.

The mental attitude of an individual is a factor in good health. A busy, cheerful mind lends great aid to digestion, while a despondent temperament has a reverse effect. In youth and in fair health the mental attitude is largely under control of the will, and just as the muscles require exercise to attain development so the mind and spirit require exercise and control. Worry and fear are bad habits much easier to prevent than to cure.

Rest and recreation are indispensable to every human being. Monotony combined with over work causes many mental and nervous disturbances. Mothers during the child-bearing period should carefully avoid anything approaching iso-

lation and monotony. Hard work, either physical or mental, is seldom injurious to health when relieved by rest, recreation and companionship, but grinding monotony with no outside interests sooner or later affects the spirits.

Exercise is essential for the maintenance of health. Rational exercise develops not only the muscles, but stimulates the action of all of the organs: the heart, lungs, skin, kidneys, brain and digestive apparatus. "Excessive exercise may injure the heart, but lack of exercise produces obesity and tends to weaken the heart, and is a common cause of morbid excitability manifested by irritability, sensitiveness and that form of nervous unrest known as 'fidgits.'" (Harrington.)

The amount of out-of-door exercise needed depends upon the occupation of the individual; the farmer and gardener get all of the exercise they need while doing their work, but persons confined to office work would find gardening a pleasurable exercise.

The mother, closely confined by housework and her children, does not need much physical exercise, but does need driving or any recreation which takes her out-of-doors.

Boating, golf, tennis and walking are as beneficial by the enjoyment they offer as by the exercise they require.

In connection with exercise attention should be

given to correct posture and habits of breathing. This should be observed and corrected when necessary with small children. The arrangement of school seats and desks causes good or bad habits of posture, as well as affecting the sight if the light is insufficient or improperly placed in relation to the seats.

The whole subject of school hygiene is one which every parent should understand, for upon it largely depends the future health of the rising generation.

Clothing.—In the selection of clothing the comfort of the individual should have more consideration. Beginning with the baby's first wardrobe, comfort, simplicity and suitability should be the first consideration. Women suffer more than men from uncomfortable clothing, which is doubtless the cause of much of their nervous irritability.

Old Age.—Advancing years are frequently accompanied by infirmities which render the individual uncomfortable and often unhappy. In many instances this might be avoided if all concerned had a better understanding of what to expect in old age. The old often suffer from two extremes—selfish neglect at one end or too much attention and regulation at the other.

Lack of occupation is productive of many infirmities. It is a mistaken kindness to think that the old should do nothing. They should just as far as

possible be allowed to occupy themselves as they wish. They need quiet and more warmth than the young, their food should be easy of digestion, and there should be some observation of their excretions and of their baths. They should have sunlight in their living rooms and the artificial light should be especially well arranged that they may read or write or sew with comfort. The light should be electric if possible; gas is particularly dangerous with old people whose sense of smell and sight is impaired. The children and young people should be taught affection and respect for the infirmities of age, and to understand that the mind as well as the body is less active as we grow old.

PUBLIC AGENCIES CONCERNING HEALTH AND WELFARE

The public agencies for the control of the health and welfare of the community should be familiar to the heads of all families. The federal government, through the U. S. Public Health Service, undertakes to protect the States as a whole from the invasion of disease from other countries and to protect the States from each other. It studies disease problems and undertakes the eradication of epidemic outbreaks. Each State has a state board of health whose duties are to guard and regulate all community affairs relating to health. In addition

there are visiting nurses' associations, charity organizations and societies particularly for children, day nurseries, milk stations which are usually maintained for educating the mothers in the care of their babies and for dispensing milk to bottle-fed babies, public baths, juvenile courts and societies for the prevention of cruelty to children, besides the hospitals and dispensaries and homes for all classes of patients. While these in the main are designed to help the poor and friendless they are of great importance to the welfare of the community and should have the support and co-operation of its more fortunate citizens.

LESSON VIII

HYGIENE OF INFANCY AND CHILDHOOD

SUGGESTIONS FOR DEMONSTRATION

1. Demonstrate by means of a doll or infant the proper position for taking a rectal temperature.
2. Show model outfit for new-born infant and for child one year old.
3. Show model nursing bottle and nipple and demonstrate proper cleansing and care of both.
4. Demonstrate bathing a young baby, preferably with a doll.

"The mother is the natural guardian of her child and no other influence can compare with hers in its value in safeguarding infant life." (Dr. Newsholme.) Statistics show that at least thirteen out of every one hundred babies born in the civilized world die before they are one year old and even in New York City, where for years a special department, under the direction of the Board of Health, has been devoted to the welfare of infants and children, one out of every five deaths is a baby under one year of age and one out of every three deaths a

child under five years of age. Improper feeding is without doubt the chief cause of this appalling death-rate, and the ultimate responsibility for its prevention must rest largely upon the mother. It is believed that proper feeding alone would reduce the death-rate among infants at least one half, but there are many contributing causes due not only to the environment and care of the child, but to the condition, habits of life and health of the parents as well. Every child has a right to be born of healthy parents and to be protected during its years of development, and it is of vital importance to the welfare of the race that mother love be supplemented by an intelligent comprehension of what constitutes a normal childhood. Children present certain unmistakable signs of health and well-being, but a mother should learn to detect any marked indications of illness.

Normal Growth and Development.—Definite tables of growth and development have been compiled, but a child may be in good health and not conform to these averages, so it must be remembered that variations are not necessarily alarming.

Average Size.—The average weight of a baby at birth is 7 to $7\frac{1}{2}$ lbs. and its average length is about 20 inches. It is not unusual, however, for a child to weigh anywhere from 5 to 10 pounds at birth or to be from 16 to 22 inches in length. A healthy baby

under favorable conditions will usually double its weight during the first five months and treble it during the first year. In other words, a baby weighing 7 pounds at birth may be expected to weigh 14 pounds when five months old and 21 pounds when a year old. If the length at birth is 20 inches the baby will grow about 4 inches during the first five months and 8 inches during the first year, 3 to 5 inches a year during the second and third years and about two inches during each of the subsequent years of growth.

Muscular Development.—A baby at birth is absolutely helpless and such motions as it may be able to make are purely instinctive. There is but little muscular control during the first few months, but at two months a baby will begin to lift its head and can usually hold it up without support when 3 months old and at 6 months will sit erect and begin to play with toys. From this time the baby will make rapid progress, attempt to stand on its feet, begin to creep and by the time it is a year old will be able to stand alone or even walk a few steps and will usually be running about without difficulty when it is fifteen or sixteen months old.

Babies should not be urged to bear their weight on their feet or encouraged to walk, as they will surely do both when strong enough, but if there is unusual delay a physician should be consulted.

Development of Special Senses.—A new-born baby is unable to distinguish objects, but the eyes, which are most sensitive to light, should be carefully protected, and the hearing which is undeveloped at birth soon becomes acute, making it advisable to keep the child in a quiet room. When a month or six weeks old it will notice nearby objects and at three months will welcome its mother if hungry, and in another month or two will begin to distinguish between familiar and unfamiliar faces, and show its approval or disapproval.

Development of Speech.—A baby when 6 or 7 months old will begin, consciously, to utter sounds and will usually be able to say a few words when a year old or even younger; but the average child does not begin to form sentences of more than two or three words until about two years old.

Development of Teeth.—There are twenty so-called milk teeth followed by thirty-two permanent teeth. The two lower front teeth (central incisors) generally appear when the child is seven months old, followed in one to three months by the four upper front teeth (upper incisors), and all of the first or milk teeth should be through by the time the child is two and a half years old.

There may be decided variations both in the order of appearing and the age of the child and this need occasion no uneasiness if the child seems well,

but it is not safe to attribute all illnesses to teething alone and any unusual conditions should be referred to the family physician. The first of the permanent teeth appear when the child is about six years old and all but the last four molars, sometimes called wisdom teeth, should be through by the time the child is fifteen years of age, but the last molars are often delayed until one is twenty or even twenty-five years old.

Normal Excretions.—A new-born baby should have one or two bowel movements during the first twenty-four hours and after it begins to nurse four to six movements a day are not unusual. This number will soon decrease, but throughout infancy and childhood as well as during adult life there should be one or two evacuations of the bowels daily. During infancy, if taking nothing but milk, the movements should be of soft consistency, yellowish in color and with but little odor. Any marked change, such as the presence of particles of undigested food, curds of milk or change in color should be carefully watched and if continued a physician should be consulted, as these are often the first signs of serious digestive trouble.

Urine.—The urine of an infant should be odorless and colorless and voided at least once during the first twenty-four hours, but much more frequently after the baby begins to nurse.

Starr gives the following table of the approximate amount of urine voided in twenty-four hours.

From birth to second year	8 to 12 fluidounces.
From second to fifth year	15 to 25 "
From fifth to tenth year	25 to 35 "
From tenth to fifteenth year	35 to 40 "

Temperature.—The temperature of an infant is somewhat above normal during the first week or ten days varying considerably, but after that time should be from 98° to 99° F. The temperature should be taken by rectum until the child can be trusted to hold a thermometer in its mouth without breaking it, probably not until the sixth or seventh year. In taking the temperature of an infant it should be placed on its back, held firmly in the lap with legs elevated and the bulb of the thermometer well oiled, carefully inserted about one inch. Keep the child quiet and hold the thermometer in place two or three minutes unless certain that it will register in a shorter time. The thermometer should not be used too frequently nor too much importance attached to a slight fever, unless it continues, for it must be remembered that the temperature of a child is much more easily affected by slight causes than that of an adult.

Pulse.—There is much difficulty in counting the pulse of an infant for the average pulse-rate from birth to the second month is from 130 to 160 beats a

minute and until six months old it is usually 120 or over.

During infancy and childhood the normal pulse-rate may be greatly increased even in health by excitement, exertion, or similar causes.

Respiration.—The respiration of children is also misleading and should be counted during sleep, as any excitement or disturbance may cause a decided increase in the number of respirations per minute. The normal respirations during the first month are from 30 to 40 a minute, gradually dropping during the succeeding months, while the normal respiration for a child two years old is from 20 to 30 a minute. If the air-passages are clear the child should breath quietly through the nose, but if the respirations are labored or the breathing is habitually through the mouth a physician should be consulted.

Clothing.—The amount and weight of the clothing should depend upon the season, but at all times the garments worn next to the skin, except the diaper, should be of wool or part wool, lightest weight in summer and heavier in winter. During the first few months the abdomen is usually supported by a flannel band about six inches wide, but it should never be applied tight enough to restrict either the abdomen or chest walls and may be replaced later by a loosely fitting knitted binder worn only for

warmth. Such a binder is especially useful if there is any tendency to diarrhœa.

Diapers should be both soft and absorbent and washed several times before using. They should be changed frequently, used but once, well washed, boiled and thoroughly dried. Under no circumstances should they be covered with waterproof material as its use is almost certain to cause irritation of the sensitive skin.

All garments for babies should be simply made, of soft material and laundered without starch. Even the first clothes should not be very long as their weight is an unnecessary burden and prevents free movements of the legs. There should be an entire change of clothing at night, and a night-gown made of warmer material substituted for both petticoat and slip. The night-gown may be closed at the bottom with a draw-string. Nearly all children are dressed too warmly indoors, but it is important that they be well protected when taken into a lower temperature.

Sleep.—Sleep seems to be the normal condition of a baby during the first few weeks and it should be left undisturbed except for the necessary care. It should not be allowed to sleep in the bed with its mother, but placed in a crib, bassinet or basket protected from drafts and direct rays of light, and from the beginning should be trained to sleep dur-

ing the greater part of the night with only one or two nursings. The amount of sleep necessary gradually diminishes, but during all the years of growth a child needs more sleep than an adult. The daily amount of sleep required for different ages is approximately as follows:

First month	18 to 20 hours
Second to sixth month	16 to 18 "
Sixth month to one year	14 to 15 "
One to two years	13 to 14 "
Two to four years	11 to 12 "

After this time a child should sleep at least ten hours out of the twenty-four. During the first year a nap in the middle of the forenoon and another in the afternoon are desirable, but they should not be long enough to interfere with the night's sleep. When a year old the afternoon nap may be omitted, if the child is doing well, but the morning nap should be continued until the fourth or fifth year. Babies should sleep with the head on a level with the body and pillows are unnecessary even for older children, but if used they should be thin and firm.

Fresh Air.—All that has been said concerning the importance of fresh air for adults applies with equal force to infants and children. During the first month the baby is especially susceptible to drafts and bright light, but the room should be well ventilated keeping the temperature as equable as

possible, between 68° and 70° F. during the day and about 65° F. at night. Even in cold weather the room should be well aired two or three times a day, removing the baby to another room while the windows are open. When three or four months old the windows may be left open at night providing the temperature of the room does not fall below 55° F., but the child must be kept well covered and protected from drafts. On warm days in summer a healthy baby may be taken out-of-doors for a short time when two or three weeks old and in the winter on bright, sunny days when three months old. The eyes should never be exposed to the direct rays of the sun while storms, high wind, dust and melting snow should be avoided.

Diet.—The greatest proportion of increase both in height and weight is during the first year of life and a suitable food, given at regular intervals, must be provided or the baby cannot thrive. Mother's milk is the only perfect food for an infant during the first nine or ten months and anything else is at the best but a poor substitute to be given only under the direction of a physician. Breast-fed babies are not only more robust than bottle-fed, but they show a far greater resistance to disease and the death-rate among them is correspondingly less. Conditions may arise making it undesirable for the mother to nurse her baby, but the question

should never be decided by members of the family or even by the mother herself. The physician should be relied upon not only for the decision, but for definite instructions concerning the food to be substituted. It is not within the scope of this lesson to give formulas for infant feeding, as they should be carefully adapted to the needs of the

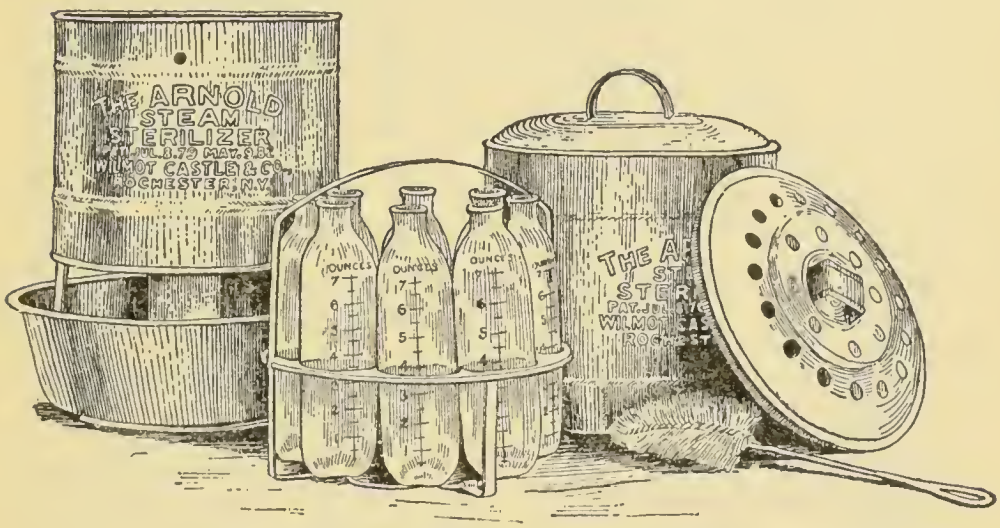


FIG. 10.—ARNOLD MILK STERILIZER.

individual child and this important subject has been treated in detail by well-known authorities. (See books of reference, Appendix, page 226.)

Intervals of Feeding.—Little milk is secreted during the first two days following the birth of the child, but it will learn to nurse much more readily if applied to the breast as soon as it has had its first

bath and the mother is rested, and at intervals of four hours during the first two days

The following schedule for the feeding of healthy babies is given by Holt in his book on the "Care and Feeding of Infants."

Age.	Interval Between Meals by Day.	Night Feedings, 10 P.M. to 7 A.M.	Number of Feedings in Twenty-Four Hours.	Quantity of One Feeding.	Quantity for Twenty-Four Hours.
	Hours.			Ounces.	Ounces.
Second to seventh day	2	2	10	1 to 1½	10 to 15
Second to third weeks	2	2	10	1½ to 3	15 to 30
Fourth to fifth weeks	2	1	10	2½ to 3½	25 to 35
Sixth week to third month	2½	1	8	3 to 5	24 to 40
Third to fifth month	3	1	7	4 to 6	28 to 42
Fifth to ninth month	3	..	6	5 to 7½	30 to 45
Ninth to twelfth month	4	..	5	7 to 9	35 to 45

Water.—Pure water, boiled if necessary, should be given regularly even to a young baby and it will often be satisfied with a little moderately hot water when fretful between the hours of nursing. If given from a bottle the baby will become accustomed to its use and accept it with fewer protests during the period of weaning.

Time for Weaning.—If possible, the baby should be breast fed, either altogether or in part, until ten or eleven months old. If either the baby or mother is not doing well, it may be necessary to change the food at a much earlier age, but it is most desirable that this should be avoided during hot weather.

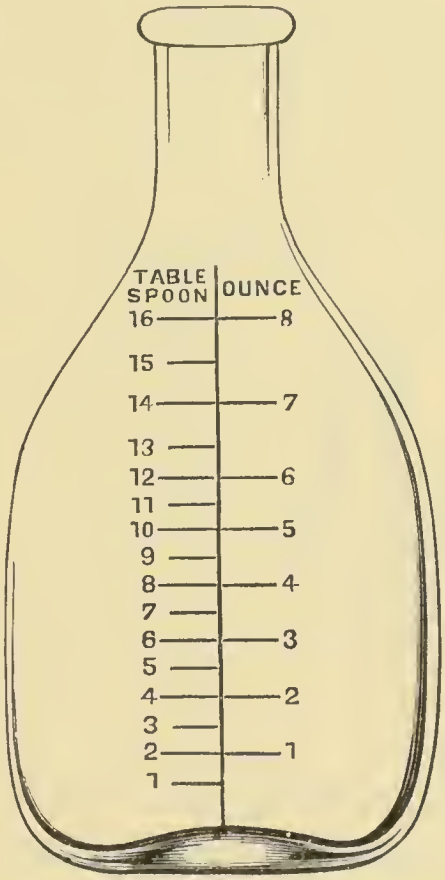


FIG. 11. — GRADUATED NURSING BOTTLE. (*Starr's Hygiene of the Nursery.*)

Selection and Care of Nursing Bottles.—The nursing bottles should be of fairly heavy glass, with rounded bottom and wide mouth, so that they may be easily cleaned. Short rubber nipples which slip over the neck of the bottles and which can be easily turned inside out should be selected and discarded when they become soft or when the opening becomes large enough to allow the milk to run out in a stream instead of drop by drop. Black rubber nipples are said to be the best. Under no

circumstances should the use of the so-called "pacifiers" be allowed.

Care of Bottle.—Remove from the baby's mouth as soon as empty, rinse at once in cold water, and place in a solution of bicarbonate of soda (baking soda), about one teaspoonful to a quart of water. Wash in hot soapsuds, using a bottle brush, rinse well in plain water and boil for a few minutes just before refilling, placing a clean cloth in the bottom of the basin to prevent the bottles from breaking.



FIG. 12.—RUBBER NIPPLE.

Care of Rubber Nipples.—New nipples should be scrubbed inside and outside and boiled for at least five minutes before using. They should be well washed each time they are used and scrubbed with a small brush to make certain that all particles of milk are removed, especially from the inside. They should be kept in a boric acid solution (one teaspoonful dissolved in a pint of boiling water) and rinsed in plain hot water before using. Boil for a short time at least once a day.

Tables of diet for children over one year of age may be found in the Appendix, pages 236 to 239.

Bathing.—The baby's first bath will generally be given by the nurse, but should this duty fall to some member of the family there are several points

to be remembered. The new-born baby should be given time to adjust itself to the new conditions and if wrapped in flannel and kept warm the bath may well be deferred for several hours, but do not begin until the room is thoroughly warm and everything in readiness. The body of a new-born baby is covered with a whitish substance which cannot easily be removed with soap and water alone, but will yield readily, if a short time before beginning the bath the body is well smeared with some bland oil, such as olive oil or white vaseline. Lard is also sometimes used but should be free from salt. In giving the bath begin with the face using little or no soap and dry well before uncovering the body. The eyes and mouth should be carefully cleansed with small pieces of absorbent cotton dipped in clean warm water, preferably boiled and cooled, using the pieces only once.

The body should then be well soaped and immersed in water at a temperature of 100° F., being careful not to wet the face. The bath should be given as gently as possible and not prolonged unnecessarily. The baby should not be kept in the water during its first bath more than a minute or two, and on removal wrapped in warm flannel. Dry without exposure, using soft warm towels and dust the folds of the body with powder. Dress at once with as little disturbance as possible drawing the garments

over the feet instead of over the head. Use no pins except for the diaper, basting the other garments lightly with needle and thread. A sponge-bath only is given during the next ten days or until the cord has separated, but after this time the baby should be given a daily tub-bath and in very hot weather an occasional sponge-bath adds greatly to its comfort. Until the child is about two months old the temperature of the bath should be kept at 98° F., then gradually reduced. When six months old the temperature of the bath should be 95° F. and during the second year 85° to 90° F. After the third year warm baths for the purposes of cleanliness may be given at night, three times a week being sufficient. The child should, however, have a cool sponge-bath, temperature 75° to 85° F., each morning. A bath thermometer is the only reliable guide and should always be used.

The Development of Habits.—Crying is one of the habits most easily developed, for during the first few months a child has no other means of expression, but quickly learns to make most effective use of its limited opportunities.

While an infant may cry lustily from the moment of its birth it does not shed tears until it is about three months old. A mother must learn to distinguish between a cry caused by hunger, pain or weakness and a cry caused by temper or simply a

desire to be taken up. These various cries are distinctive but difficult to describe. A cry caused by hunger is fretful, often interrupted by sucking of the thumb and ceases when the child is fed. If caused by indigestion the cry is similar, but relieved for only a short time by feeding, when the child begins to cry again. If there is acute pain, such as earache, the cry is sharp, repeated at frequent intervals and accompanied by other symptoms of distress, such as restlessness, contraction of features and drawing up of legs. In serious illness the cry is usually feeble, fairly constant except when the child is asleep and exaggerated by slight causes. A child is not likely to cry from temper during the first four months, but the signs are unmistakable. The cry is loud and violent, and the body rigid or accompanied by vigorous kicking. Prompt treatment will prevent many months of discomfort and spare the baby the formation of its first bad habit. Eliminate all other possible causes and make sure that the child is warm and dry and comfortable; then if crying continues Holt says—"It should simply be allowed to cry it out. This often requires an hour and in extreme cases two or three hours. A second struggle will seldom last more than ten or fifteen minutes and a third will rarely be necessary."

By the time the baby is three months old or even sooner an effort should be made to develop habits

of regularity in the evacuation of the bladder and bowels. If taken up regularly most children will have learned to use a chamber, at least during the day, when they are about a year old.

Instinctively a baby carries everything to its mouth—first its thumb, then its playthings and later whatever it may find, no matter how unsuitable. For the safety and protection of the child this habit should be overcome as soon as possible and when it is old enough to understand it must be taught to put nothing in its mouth but food and drink. It is supposed that children sometimes become infected with intestinal worms through their habit of putting things into their mouths. Any one who has seen a child in the convulsions caused by worms should be willing to give herself any amount of trouble to break this bad habit. When the child is allowed to come to the table for its meals it should be taught to eat slowly, allowed only plain wholesome food, and as it grows older any unreasonable discrimination against certain articles of food should be discouraged. A person who goes out into the world with a taste for only a restricted variety of foods is handicapped at the very beginning. The habit of eating between meals should be guarded against and throughout childhood rich foods should not be allowed. A small amount of sweets in the form of home-made candy, honey or

simple deserts may occasionally be given to children after they are 5 or 6 years old.

Play and Toys.—The desire for play does not develop until the child is about six months old, when a bright toy or rattle gives much pleasure. A child at this age cannot be prevented from putting things in its mouth and toys which can be washed, such as hard or soft rubber, should be selected. Relatives are nearly always tempted to give too many toys and fragile ones which only teach a child to be destructive and to constantly expect something new. Toys are the first possessions of which a child is conscious and through them many desirable qualities may be developed by an intelligent and tactful mother: neatness and order, gentleness and a feeling of protection toward the helpless doll or Teddy bear, and unselfishness in sharing special treasures with playmates. Pets may later be substituted for toys and the child under supervision made responsible for their care.

Exercise.—From the hour of birth exercise is essential to the development of the body, but during the first two weeks warmth and quiet are so important that the baby should not be disturbed except for the necessary care and feedings and an occasional change of position. After this it may be given regular exercise by carrying in the arms for a few minutes several times a day, with the back

and head well supported, at first on a pillow. The clothing should be sufficiently loose to allow free movement of the arms and legs and to make no constriction of chest and abdomen. As the baby grows older more exercise will be needed and this can be provided by removing the outer clothing and placing the baby on a bed in a warm room for a short time each day. When more active and in danger of falling it may play on a mattress or thick blanket placed on the floor. This should be covered with a rubber cloth and clean sheet and surrounded by a fence at least two feet high. In such an enclosure a baby may safely be left to play if protected from drafts and cold. As soon as a child begins to run about it will take ample exercise and may even need to be guarded from over fatigue especially toward bedtime. When the weather is pleasant the waking hours may well be spent out-of-doors. During the years of childhood girls and boys alike should be encouraged to play and the development of a vigorous body should not be sacrificed to the cultivation of the mind. Games and play should be sufficiently varied to exercise all portions of the body and adapted to the age of the child, but should be neither too violent nor too prolonged. A certain amount of supervision is necessary, but the child should be given as much freedom as possible in its play and allowed to develop its own

initiative. Early in life the child should be trained to walk correctly and taught right posture, especially when studying or writing, while tables, chairs and desks suitable for its size should be provided. Faults of posture can usually be overcome without difficulty if taken in time and the body should be examined occasionally to ascertain whether the shoulders and head are carried too far forward, whether the weight is borne evenly on both feet and the development of the two sides is uniform.

LESSON IX

BEDS, MATTRESSES, PILLOWS AND BEDDING

SUGGESTIONS FOR DEMONSTRATION

1. Show pillows and bedding of desirable size and quality.
2. Show air-pillow and demonstrate its use.
3. Show rubber sheet and pillow-case and demonstrate emergency protection of bed.

Beds.—It has been said that the best bed for an invalid is his own and it is probably true that in the beginning of an illness, unless the condition is serious too great a change from the accustomed mode of life adds to the apprehension of the patient. A suitable bed is however most essential in the long-continued care of a helpless person and such a bed has been evolved through many years of hospital experience. These beds are no more expensive than those usually purchased for use in the home and it would be well if in every household at least one were available in case of need. In making a selection simplicity and durability should be considered. White enameled iron beds, brass or brass

and iron combined are most easily kept clean and may be found in simple attractive designs. The bed should be strong enough to stand firmly when set up yet not too heavy or it will be difficult to move. There should be as few angles as possible and all joints should be smooth and well finished. The springs should be made of double woven wire stretched tightly and attached to a metal frame, so constructed as to fit smoothly into the head and foot pieces. For convenience in moving large castors should be used, but it may sometimes be desirable to remove them from one end, usually the foot, to prevent unnecessary motion. The most convenient dimensions for a bed to be used in case of sickness have been found to be—length, 6 ft. 6 in., height, 24 to 26 inches, width, 36 inches. If the bed is either too high or too low it adds much to the labor of lifting or moving the patient. If too wide it is difficult to reach the center without leaning or kneeling on the bed, and if less than the given length will prove most uncomfortable for a tall person.

If the patient is below average height and has difficulty in getting in and out of the bed a broad firm stool may be provided, or when sitting on the edge of the bed the feet may be placed in a low chair. Beds with complicated attachments for moving patients are not recommended for family

use as they are expensive, liable to get out of order, seldom needed and generally unsatisfactory.

Fracture Beds.—A fracture bed is used when it is necessary to have a bed with a firm flat surface to prevent the displacement of broken bones, and can be secured by placing a foundation of boards slightly separated or with holes bored for ventilation between the mattress and springs.

Folding beds and **lounges** even of the best type are unhygienic, usually too low for the comfort of the patient and often insecure.

Wooden beds are difficult to keep clean and even with care are liable to harbor vermin. They readily absorb moisture and odors, cannot well be disinfected and the solid frames prevent a free circulation of air. A bed occupied by an invalid should be so placed that it may be easily reached from all sides.

Mattresses.—Various substances are used in the manufacture of mattresses, but nothing has yet been found as satisfactory as curled hair. It is light and clean, does not readily absorb odors and is easily renovated. It is more expensive than many other materials, but a good quality of hair may be kept in excellent condition almost indefinitely if the mattress is occasionally made over and the hair renovated. Felt or cotton makes a firm mattress, but is much heavier than hair and more

difficult to keep clean. If carefully prepared a useful mattress can be made from straw and is sometimes found in country districts. There is no more hygienic bed for the worn straw can be burned, tick washed and refilled with clean straw without expense and if available might well be used for cases of contagious disease, or when frequent discharges make the adequate protection of the mattress difficult. Such a bed needs careful attention or it will be hard and lumpy and the straw should be arranged evenly each day through an opening in the upper side of the tick. The least desirable of all mattresses is the old fashioned feather bed as it furnishes the conditions necessary for the development of bed-sores—warmth, moisture and uneven pressure. It should not, however, be arbitrarily taken away from an old person long accustomed to its use unless the welfare of the patient is really at stake. Mattresses are sometimes made in sections, as they seem to wear more evenly and are lighter to handle, but this is not necessary for a single bed, and a mattress made in one piece is more easily kept in place if the patient is restless. A good quality of blue and white ticking makes the most serviceable cover for both mattress and pillows as this color is less likely to run if the mattress and pillows become wet.

Air and Water Mattresses.—These are usually

available for special cases in hospitals, but are not in general use in private families. They are expensive, rather difficult to adjust and easily ruined—even a pin-prick being sufficient to render them useless.

An air mattress is really a large air cushion and should be placed on the top of another mattress and partly filled with air, using an ordinary air-pump. It should be full enough to present an even surface for the support of the body, but if too full it will give the patient a feeling of insecurity and he may even fall out of bed if restless. A water-bed is much more difficult to fill and adjust and requires a firm support. It may be filled from a hose or with pitchers and the temperature of the water should be 100° F.

Pillows.—It is customary in hospitals to provide each bed with a feather and hair pillow. They should be neither too large nor too thick for if a patient wants the head higher he can be made more comfortable with an extra pillow. Hair pillows are seldom found in private homes, but are really a necessity in high fevers or where there is excessive perspiration and will often be found a relief in very warm weather. Small pillows are useful to support different parts of the body and it is well to have several of different size and thickness.

Air-pillows are not durable enough for general

use, but are a great convenience in traveling and add much to the comfort of a patient when first allowed to go out in a carriage or automobile.

Bed Protection.—In all cases of sickness the proper protection of the bed should receive first consideration. The amount of protection needed will of course depend upon the nature of the illness, but neglect in this particular is inexcusable and may be the cause of considerable expense and trouble as well as discomfort to the patient.

The materials used for the protection of the bed are large quilted pads, small pads, cover for mattress, rubber sheets and pillow cases, waterproof paper or even old blankets and quilts which may be easily washed.

Rubber Sheets and Pillow-cases.—Soft rubber cloth, single or double faced, can now be purchased by the yard and is much more comfortable than the heavy rubber blankets formerly in use and should be provided, whenever necessary, for the protection of the bed. A rubber sheet is usually put on over the bottom sheet and covered by a draw sheet, but in case of slight illness a patient may object to its use and under these circumstances it may be placed next to the mattress, covered with mattress pad and bottom sheet, or left off altogether. In case of serious illness, such as typhoid fever, the rubber sheet should be large

enough to cover the whole mattress and fasten securely on all sides.

Rubber pillow-cases are a necessity when there is profuse perspiration, discharges of any kind from the head or neck or when local applications, such as ice-cap or cold compresses are applied to the head. They should be put on next to the pillow, securely fastened with tapes, snap hooks or buttons and covered with the cotton slip.

Emergency Protection of Bed.—In an emergency ordinary table oil-cloth may be used to protect the bed, but it is stiff and likely to crease. Waterproof paper also makes an excellent substitute for rubber cloth or several thicknesses of ordinary newspaper will often answer every purpose.

Rubber sheets and pillow-cases should be used carefully and frequently examined for holes or worn places by holding them up to the light for even the prick of a pin if near the center may allow water to soak through.

Pads.—A quilted cotton pad somewhat larger than the mattress, a slip cover which can be easily removed and laundered, or an old blanket should always be placed under the bottom sheet to keep the mattress clean. Small pads made from absorbent material, such as cotton or waste and covered with old muslin or cheese-cloth, are useful in case of sickness to protect parts of the bed and bedding

from discharges and local applications. A thickness of waxed paper or newspaper may be inserted between the layers if desired.

Counterpanes.—White dimity counterpanes are the most desirable, for they are light in weight, easily laundered and inexpensive. A heavy counterpane is uncomfortable at any time, but especially so in sickness, and if nothing else is available a sheet may be substituted. A counterpane should be wide enough to cover the sheets and blankets at the sides when the bed is open and long enough to protect the bedding at the top and bottom.

Sheets.—Not only are sheets of ample proportions necessary for comfort, but so important for sanitary reasons as well that one state at least has enacted a law requiring hotels and other public places to supply sheets which meet definite requirements as to size. For a bed of the dimensions indicated in this lesson sheets should be two and three-quarters yards long and two yards wide. A safe rule for any bed is to have the sheets one yard longer and one yard wider than the mattress. This will allow plenty to tuck under the sides of the mattress and the foot and leave at least twelve inches to fold over the blankets at the top. Cotton sheets are more desirable for general use than linen and much less expensive.

Draw-sheets are used when additional protection

for the bed is needed and in hospitals special sheets are usually provided for this purpose. An ordinary sheet folded once crosswise through the middle answers every purpose, but new and expensive sheets should not be used in this way, as they are liable to become stained or torn. Draw-sheets should be wide enough to extend several inches beyond the rubber sheet at the top and bottom and will keep in place better if the upper edge comes under the lower edge of the pillows. It is sometimes difficult to keep the draw-sheet in place without pinning at the sides, but this should be avoided, as it is almost certain to tear the sheets and mattress cover.

Blankets.—Wool blankets are the most comfortable covering for a bed as they are both light and warm, but unless one can afford to have them frequently dry cleaned it is safer to select those made from one part wool and two parts cotton. Equal parts of wool and cotton are warmer but injured more by washing. Double blankets should always be cut in two and the ends neatly bound. They are easier to handle and launder and just the right number may be used. It is a trying experience, even for a well person, to attempt to throw back a portion of the bed covers and encounter the unassailable fold of a double blanket. In the home care of the sick the patient is usually too warmly covered,

and except in special diseases, when the physician will give definite instructions, this should be guarded against. Too much warmth is enervating, causes the patient to perspire and makes him much more susceptible to drafts or changes of temperature. Two light blankets are warmer than one of equal weight and more comfortable.

Comforters and Quilts.—Heavy cotton comforters are burdensome without being correspondingly warm, but eiderdown quilts or those padded with wool are sometimes useful if the room is to be kept at a very low temperature or the patient is sleeping out-of-doors. Any bed cover which cannot be readily laundered should be protected on both sides by basting at the top a wide piece of muslin or linen, hemstitched if one desires, which can be easily removed and washed.

Pillow Covers.—Cotton is also more desirable for pillow covers than linen, but the latter is often preferred by people accustomed to its use and is less objectionable than in the case of sheets where linen is likely to chill the body. Unless fastened with buttons or tapes pillow-cases should be several inches longer than the pillow or they will draw back and leave the tick exposed. They should be wide enough to slip on easily, but if too large they will wrinkle and allow the pillow to turn or if too tight will make it hard and uncomfortable. In

health these trifles may seem unimportant but they may add much to the discomfort of a restless or nervous patient.

Care of Beds and Bedding.—The directions

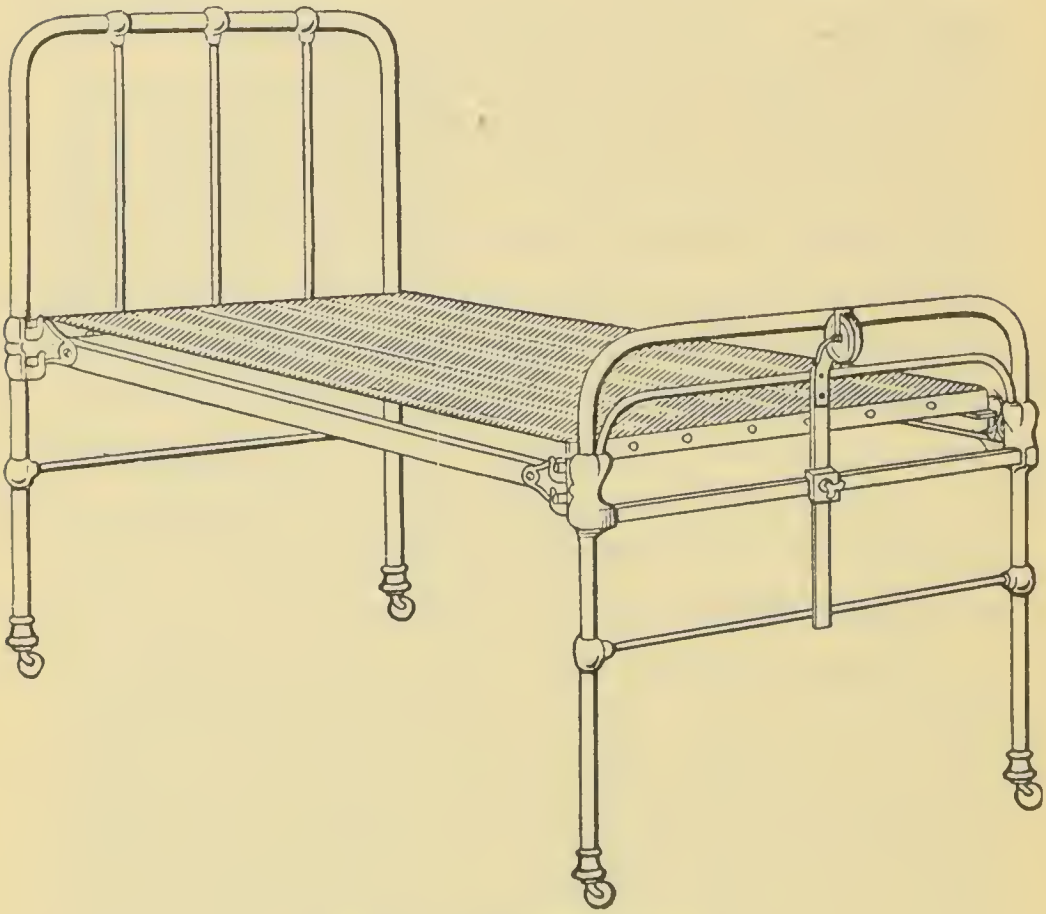


FIG. 13.—SANITARY BED.

already given for the care of beds and bedding should be carried out with even greater attention to detail in case of sickness.

Care of Bedstead.—The bedstead should be

wiped with a damp cloth daily, and if it is white enameled iron it can be washed with soap and water and any spots removed with Sapolio or whiting. A brass bed requires more care, for in addition to the regular cleaning it will need an occasional polishing, but this should not be undertaken when the bed is occupied. Dust should never be allowed to accumulate in bed-springs, especially where the springs are attached to the frame, and may be cleaned with a stiff brush dipped in kerosene oil. The excessive use of water should be avoided, as it is likely to cause rust and make it more difficult to keep the springs clean.

Care of Mattress.—A mattress should not be used constantly, and if a patient is long confined to bed it should be removed and a fresh one substituted. Brush well with a whisk-broom, especially around the tufts and edges, beat with a carpet beater and leave exposed to the sun and air for several days. If badly soiled the mattress should be made over, as it is impossible to clean it properly at home. Blood stains, if they have not soaked through the cover, may often be removed by the application of a thick cream made from raw starch and cold water.

Care of Bedding.—A generous supply of bedding is at all times a luxury and especially in sickness, but one should guard against extravagance and

with a little care and forethought a bed may be kept fresh and clean without too frequent changing of sheets and pillow-cases. When making a bed place covers neatly on a chair, being careful not to drag the corners over the floor. Sheets which are only crumpled may be aired and folded and used again, and pillow-cases which are wrinkled may be used at night and a sheet substituted for the counterpane. Blankets and counterpanes which are not in use should be kept neatly folded and protected from the dust.

Rubber sheets when soiled should be laid out flat on an even surface and washed on both sides with soap and water, using a small brush if necessary. They may be then rinsed in a disinfectant solution and when thoroughly dry should be rolled rather than folded as the rubber is liable to wear at the folds. If a pillow tick becomes soiled the feathers may be transferred to a clean tick by making an opening about six inches long in the end of each tick and joining them together, when the feathers may be shaken from one tick to the other and opening closed. If the feathers themselves have become soiled they should be renovated, but as a rule this cannot be done at home.

LESSON X

BED MAKING

SUGGESTIONS FOR DEMONSTRATION

1. Demonstrate making an empty bed and one occupied by patient.

2. Demonstrate proper methods of lifting a patient, of changing mattress under a patient, and of changing pillows.

3. Demonstrate moving patient from bed to chair, and from one bed to another.

Bed Making.—In hospitals special emphasis is placed on the making of beds and various methods have been developed all based on a few underlying principles. The uniformity which adds so much to the appearance of a hospital need not be considered in the home care of the sick, but many of the details of hospital bed making may be advantageously adopted in the home.

To Make an Empty Bed.—Pillows and covers should be removed one at a time and placed on chairs near an open window. Mattress should be brushed and turned back over the foot board or set up on the ends to air. Wipe the bedstead with a damp cloth and when the mattress has aired replace,

turning it from side to side and from end to end on alternate days. Unless the mattress is enclosed in a slip, cover with a white quilted pad or an old blanket followed by the bottom sheet. Place the center fold of the sheet over the middle of the mattress keeping it in a straight line from the head to the foot. If the sheet is of proper length fourteen or sixteen inches may be left at the top to tuck under, but the mattress should also be well covered at the foot. The bottom sheet may then be tucked under as far as it will reach on one side and a rubber sheet, at least one yard wide, placed over it crosswise of the bed, with the upper edge high enough to meet the lower edge of the pillows. A draw-sheet somewhat wider than the rubber sheet should then be put on and both tucked securely under the mattress. If a folded double sheet is used the fold should be at the top. A bed may be completed on one side before going to the opposite side and this method doubtless saves time and steps, which are important considerations in hospital work, but the amateur will probably find it easier to adjust the lower sheets on both sides before putting on the upper covers. When lower sheets are adjusted on one side of the bed go to the opposite side, draw the bottom sheet over smoothly and tuck it under the mattress as before, beginning at the center. The rubber sheet and draw sheet should be drawn as

tightly as possible and carried well under the mattress. The under sheet may next be tucked in at the top and bottom, folding the corners back to make a neat finish. The broad hems of both sheets should be placed at the top of the bed facing each other, thus bringing the smooth side of the hem on the upper side of the top sheet when it is turned over the blankets. The upper sheet should be long enough to tuck well under the mattress at the foot and leave ten or twelve inches to fold over the blankets at the top. It is customary in hospitals to fold blankets on an empty bed in such a way as to give a square finish to the sides and corners, but this necessitates rearranging the bed when it is opened and has no practical advantage. If blankets are not long enough to tuck in at the foot the upper one may be put on five or six inches lower than the first. This arrangement not only holds the covers in place at the foot, but avoids too much bulk around the face. The counterpane should be put on evenly and smoothly and either turned under the blankets and covered by the top sheet or used to finish the bed. Pillows should be well shaken, smoothed out, cases straightened and placed neatly on the bed. Practice is absolutely essential before one is able to make a bed easily and quietly, and a certain amount of proficiency should be acquired before undertaking to make a bed with a patient

in it, for in case of serious illness the making of the bed may be a source of weariness and distress to the patient or of restfulness and comfort. One must learn to work in an orderly way, without confusion or discussion, and to avoid all unnecessary motion or jarring of the bed.

To Make a Bed with a Patient in It.—The following directions are given in "Practical Nursing," by Maxwell and Pope, and is the method taught in many hospitals:

"(1) Before starting to make a bed with a patient in it, be sure that everything necessary is at hand.

"(2) Loosen the bedclothes on all sides. As you draw out the clothes with one hand, raise the mattress with the other, to avoid jarring the patient and tearing the clothes.

"(3) Take the pillows out and shake them. If the patient does not object to being without them, leave them to air till the bed is made.

"(4) Take off the spread, and if there are two blankets on the bed, remove the upper one.

"(5) Change the top sheet if necessary. When crushed but not soiled the top sheet may be used for a draw sheet.

"(6) Fold the lower blanket and top sheet up over the patient, leaving it just wide enough to cover him when he is turned. This answers a threefold purpose: it gives a neat appearance; the clothes are not in your way while you work; and it replaces the discarded blanket.

"(7) Change the night-gown if it is soiled; if not, brush all crumbs out of it.

"(8) Change the under sheets, if necessary; if not, tighten the under sheet and rubber and pull the draw sheet partly through, that the patient may have a fresh, cool spot to lie on.

"(9) Rub the patient's back with alcohol and powder.

"(10) Sweep all crumbs from the bed, either with the hand, a small whisk-broom, or a folded towel. Always use the hand under the patient, since only with it will all crumbs be discovered.

"(11) Tuck in the top sheets and blankets, being careful to keep them loose at the bottom, over the patient's feet. If the weight of the bedclothes on the feet is uncomfortable put a bed-cradle over the feet.

"(12) Put on the spread. Tuck it in at the foot, and when making a closed bed, but fold it back under the blankets at the top, and turn the upper edge of the sheet over it.

"(13) Replace and arrange the pillows so that the patient lies comfortably, every part of the body being supported.

"These details should be carried out in the order in which they are given, since crumbs may be introduced into the bed by changing the nightgown, pillows and upper bedclothes after the lower sheet."

Methods of lifting and moving a helpless patient can only be taught by actual demonstration, for one must learn to make the patient comfort-

able without injury to herself either through over-lifting or improper lifting.

General Directions.—The knees should be braced against the bed, chest well forward, muscles of abdomen drawn in and the weight held from the shoulders and upper arms bending the back as little as possible. If necessary to lean over the bed bend from the knees and hips keeping the back rigid. Never attempt to lift a patient alone if help can be secured.

Changing Pillows.—Pillows should be frequently changed and rearranged and if a patient is helpless he must be firmly supported during the process. Stand preferably on the right side and slip the left arm under the shoulders, supporting the head in the hollow of the arm. Raise slightly and remove the pillows one at a time, drawing them outward on the opposite side of the bed, placing a small pillow temporarily under the head. Shake the pillows, change cases if necessary and place on the far side of the bed ready to be drawn under the head. Raise patient as before, remove the small pillow and draw the others in place. It is sometimes more comfortable for the patient to be held on the upper pillow while removing and replacing the under one. If additional pillows are needed they may be inserted in the same way and should be arranged to support the back and shoulders as well as the head.

Lifting a Patient in Bed.—There is nearly always a tendency for a patient to slip down and away from the pillows. If unable to help themselves it will be necessary to lift them up in bed several times a day. To do this flex the patient's knees and instruct him to press the feet firmly upon the bed; place one arm under the shoulders, as when changing the pillows, the other arm under the thighs, and lift upward. This can be done much more easily by two people and with far greater comfort to the patient The procedure would then be as follows: *A* should place the left arm under the head and shoulders as before, the right arm under the small of the back; *B's* right arm should also be placed under the small of the back and the left arm under the thighs. In this way the weight is so evenly distributed that a heavy person can be lifted without difficulty.

Turning a Patient in Bed.—Frequent change of position is not only restful, but will help to prevent the formation of bed-sores. Always turn a patient toward you that he may feel himself supported and in no danger of falling out of bed. Place one hand over the far shoulder and the other over the hip, drawing him gently but firmly toward you, and if desirable to leave in this position for a time the knees should be slightly flexed and the back and shoulders supported by a pillow placed lengthwise.

To Change Mattress Under a Patient.—(1) Remove all the covers except a single blanket and leave only a small pillow under the head.

(2) Loosen the under sheets, roll on either side close to the body and move the patient over to one side of the mattress.

(3) The mattress should then be drawn from the opposite side about half way off the bed, leaving the patient on the side near the center of the springs.

(4) Place fresh mattress covered with clean under sheets on exposed portion of springs close to the other mattress and draw the patient over by means of the rolled sheets.

(5) The first mattress may then be removed, the fresh one drawn into place and the bed completed in the usual way.

To Turn a Mattress.—Proceed as above using two pillows or a folded blanket to support patient while turning the mattress.

To Move Patient from Bed to a Chair.—Select a comfortable chair with back and sides high enough to give support to head and arms, place at the side of the bed, and if a rocker is used put books or pieces of wood underneath the rockers to keep the chair firm while the patient is being moved. A sofa pillow or cushion should be placed in the seat and a fresh pillow at the back. Warm clothing will be needed, but it is not advisable to make elaborate

preparations the first time a patient sits up or he will be exhausted before really out of bed. Warm stockings and slippers, a dressing-gown and perhaps some extra underwear are usually all that is necessary. Place a warm blanket diagonally over the chair leaving an ample amount to cover the feet. Have the patient sit on the edge of the bed and give sufficient assistance to carry him over into the chair gently and without any jar as he sits down.

The lower point of the blanket may then be wrapped around the feet, pinned with a safety-pin and the ones at the side crossed over the lap. Place the feet on a cushion, stool or low chair, whichever is most comfortable, and if necessary use an extra wrap or blanket around the shoulders. Watch carefully for signs of fatigue and return to bed promptly. A half hour is usually sufficient the first time the patient sits up after a long illness.

To Move a Patient from One Bed to Another.—The fresh bed should have the lower sheets in place but not the upper covers. Draw the beds closely together letting one mattress extend a trifle over the point where they meet. Loosen the draw sheet under the patient roll on both sides close to the body and carry him gently over on this sheet, moving the shoulders at the same time if helpless. If the beds are of unequal height they may sometimes be built up with firm pillows or

folded blankets, but if there is much difference it will be easier to carry the patient from one bed to the other. This ought never to be undertaken by one person except in the case of a child or very small person. At least two people are necessary. They should stand on the same side of the bed place the arms under the patient in such a way as to distribute the weight evenly and follow the general directions for lifting. One method is as follows: Let *A* place her right arm under the shoulders and the left under the small of the back, while *B* places the right arm under the hips and the left beneath the knees. Draw the patient to the edge of the bed and when ready to lift instruct him to hold the body rigid. A stretcher may be improvised by rolling two long sticks or broom handles in each side of the lower sheet or strong blanket.

To Change Night-gown.—In long-continued illness it is more comfortable to have night-gowns open all the way, preferably down the back, but as these are seldom available except in hospitals it is well to know how to change those in general use deftly and without discomfort to the patient. A night-gown may be removed by drawing it well up around the neck then bend one arm and remove the sleeve, carry the gown over the head from under the shoulders and off the other arm. A clean gown may be put on by simply reversing the process or

both arms may be carried up over the head, the sleeves drawn on together, the arms lowered and the gown pulled down smoothly under the body, straightening it from side to side, that there may be no wrinkles under the back. The patient's arms should never be pushed through the sleeve but grasp the whole hand firmly and draw the arm through, being careful that the fingers do not catch in the folds of the gown. If more than one garment is worn place one inside the other and put on as a single garment. If either arm is injured remove gown from the well arm *first* but replace on the well arm *last.*

To Change the Lower Sheet with the Patient in Bed.—The lower sheets should be changed at least once a day even if it is necessary to use them again, for when one is in bed constantly lower sheets are sure to become damp and nothing is more grateful to a restless patient than a fresh, cool bed. Remove pillows and replace by a small one if the patient is uncomfortable, remove all covers except the top sheet and one blanket and fold these back over the patient well out of the way. Loosen the bottom sheets all around and move the patient to the edge of the bed or turn on one side. If helpless he should be supported by a second person to avoid the possibility of falling out of bed. Next roll the draw sheet and rubber sheet together if they are both to

be removed or separately if the rubber sheet is to be left on the bed; then roll the bottom sheet throughout its entire length and carry them close to the patient's body. Fold about one-half of the clean bottom sheet lengthwise like a fan and place the folded portion close to the rolled soiled sheets keeping them all as flat as possible. Tuck in at one side and to the center of the bed at the top and bottom. The draw-sheet, and the rubber sheet also, if it needs changing, may then be folded and put on in the same way as the bottom sheet. The fresh side of the bed will then be ready for the patient who may be turned or lifted over, the soiled sheets removed and the clean ones drawn through.

Arrangement of Pillows.—It is difficult to make a patient comfortable when sitting upright in bed, with pillows alone, but they can be arranged in many ways to relieve pressure and lessen the fatigue of long-continued illness.

A patient may be raised partially in bed by placing a soft pillow under the small of the back and as many others behind this as may be needed to secure a comfortable position. A large wedge-shaped pillow filled with hair or some firm material may well be substituted for the under pillows and will keep in place much better. A small pillow may be used to support the head, but it should not be

large enough to force the chin forward on the chest. A folded pillow placed under the knees or a round pad made for the purpose will hold the patient up in bed and relieve tension on the muscles of the abdomen.

LESSON XI

GENERAL CONSIDERATIONS OF THE CARE OF THE SICK IN THEIR OWN HOMES

The importance of good nursing for the sick can scarcely be overestimated, and while there are still persons who cite the countless generations when trained nursing was unknown, it would be quite as reasonable to argue that because our ancestors knew nothing about steam and the telegraph we might get on as well without them.

The development of modern surgery, of obstetrics, the care of infectious diseases, of mental disorders and the especial attention to sick dietary make the well-educated nurse a necessity; but there still remain many minor ailments, chronic illnesses and stages of convalescence which intelligent dependable women may attend in their own families, with satisfaction to patients and doctors.

To nurse the former class of patients needs a long thorough drill under constant supervision, and daily instruction both practical and theoretical upon medical, surgical, obstetrical, contagious and

children's diseases. One may see hundreds of cases of typhoid fever, but each patient has typhoid fever in his own way, and every case is a new one from which an observant doctor or nurse can learn; hence the necessity of trained observation which readily recognizes the variations and combinations of symptoms in each case. There are doubtless thousands of healthy mothers and babies who have not had skilled nursing when the babies were born, but we must also remember the thousands of mothers who have lost their health or their lives for lack of proper nursing during the lying-in period, and the great percentage of the blind who have lost their sight from infection at birth.

The isolation and prevention of further contagion in contagious diseases, cannot be properly done by the untrained, who have not had the long drill in the principles and practice of proper methods.

There are many minor surgical cases which the mother or sister may care for after the first twenty-four hours, if the doctor attends to the dressing, and there are innumerable medical illnesses which mostly need to be waited upon and made comfortable, to insure a quick recovery. In many of the children's diseases the mother would make the best nurse, if her sympathies did not run away with her judgment, but it is easy to understand how difficult

it must be for her to do the hard thing which is best for the child.

It is impossible to lay down fast and hard rules saying "this you may or may not nurse," the question should be decided by the doctor, who is the one to take the responsibility. If the question of a nurse must be considered from the standpoint of expense and the patient is ill enough to require a skilled nurse, the visiting nurses in all large cities may be called upon to help. There have been thousands of very sick patients who have made excellent recoveries with the care given them by an hour's daily call of the visiting nurse, who advises, helps and teaches, and the faithful co-operation of a good wife, mother or sister.

If there is more than one member of the family to help in the nursing there should be but one to see the doctor, make the report and get the orders. Too often several members of the family try to do the talking and directing, and confusion results.

The chief danger in amateur nursing lies in unrecognized symptoms and changes in the patient's condition, and only training and education can make these changes recognizable; another danger is in confusion of orders where several persons are helping; also confusion in the sick room itself which is used for a sort of clearing-house to settle the affairs of the entire household. The amateur nurse

is inclined to be nervous, anxious and "fussy," asks the patient too many questions, generally talks about all she does and considers that going without sleep or food is proof of her devotion, instead of realizing that an exhausted sleepy nurse is wholly unfit to be trusted with drugs and orders, or to note changes in the patient's condition. Efficiency and fatigue have never pulled together since the world began, and neither the amateur nor the trained nurse can do good work when quivering from lack of sleep and rest.

The model sick-room is on the south or east side of the house, away from the noise of the kitchen and living room, on the floor with a bathroom, is shorn of all superfluous decorations, draperies and furniture, has plenty of light, and is easy to ventilate, heat and clean. The bed should be easily accessible to both sides and should not face the light. Closets opening into the room, bureaus and chiffoniers should be emptied of the belongings of other members of the family, to avoid any person "tiptoeing" into the sick-room at all hours to remove garments from these receptacles, the sick-room should for the time being belong entirely to the patient and any inconvenience or discomfort be put upon the well.

Bare floors and a few small rugs are the best, but in contagious cases the rugs and every article

not an absolute necessity should be removed from the patient's room. Dustless mops are a blessing in gathering up lint and dust from the bare floors, being noiseless as well as dustless.

Vases of flowers should have fresh water daily, all dead leaves removed and the vases removed from the sick-room at night.

Every possible precaution should be taken to avoid unnecessary noises; flapping curtains, squeaky doors and rocking-chairs, heels without rubber, creaking corsets, starched petticoats, ticking clocks, refractory bureau drawers, rustling newspapers and whispering are among the every-day noises which get on the nerves of the sick and well alike. It is noticeable that the ordinary out-of-door sounds do not usually disturb the sick, except when the country patient is brought to the city, or vice versa, but it is the noise which might be avoided that distracts and harasses the nervous patient.

Daily Routine.—Keep the temperature of the room as near 70° as possible during the day, lower at night, depending upon the patient's condition and the nature of his malady.

The first duty in the morning is usually to take and record the temperature, pulse and respiration, then wash the patient's face and hands, tidy the hair and smooth out the bed, a quick putting in order that the patient may have breakfast comfort-

ably. This of course would not apply to a patient on a purely liquid diet, whose nourishment is given under orders at regular hours.

After breakfast write the night report, give any special orders, such as an enema, give the bath, comb the hair, brush the teeth and change the necessary bed and body linen. The room should then be put in order if the patient is not allowed to get up; if the patient is allowed to get up it is much better to pull his chair or lounge into another room and allow the bed-room to air, pulling the bed to pieces and spreading all of the bedding over chairs, and turning the mattress. Nothing is more refreshing to a patient than a fresh bed, and for that reason the trouble of changing the bed and body linen for the night is well worth the effort.

There should be a regular time for the patient to use the bed pan, usually every six hours as at 10 a. m., 4 p. m., 10 p. m., and 4 a. m.; these hours do not clash with meals and most patients soon fall into regular habits. The regularity also enables the nurse to have a better knowledge of the excretions, which is of great importance. All evacuations of the bowels and bladder should be recorded.

Visitors are best allowed either just before or just after lunch, by the middle of the afternoon the patient will begin to feel tired and should take a nap or at least be free from visitors. Take the tem-

perature and pulse just before the evening meal, which should be simple, and then get the patient settled for the night at an early hour.

When a patient is allowed to get up for the first time the doctor should state definitely when and for how long; the responsibility should rest with him not with an amateur who may not understand the dangers.

It may not be out of place to say here that all decisions about medicines, treatments and diet are the responsibility of the doctor and his word is law, he should give plain concise written orders which are within the understanding of the person in charge, and she on her part should be sure she does understand and then carries them out to the best of her ability.

Preparations for the Night.—Give the patient a light sponge-bath, clean the teeth, brush the hair, look after the places where pressure may make bed-sores, change the night-gown, brush out the bed with whisk-broom or change the sheets, smooth out wrinkles in bed-clothing, shake up the pillows, air the room thoroughly, take out flowers, empty slop jar, give the patient a drink of milk, broth or anything wanted and allowed, be sure the feet are warm and that there is enough and not too much covering, and last, arrange the light.

If a patient is inclined to be wakeful a hot foot-

bath may relieve him and sometimes after all the other things have been done, sponging the spine from the back of the neck its whole length with very hot water, and long downward quiet strokes for fifteen minutes, may be effectual.

The above directions are given in the order in which they should be carried out, and they should be done quietly and with no hurry, fuss or talk, in short try to encourage sleep. If there is a grate or stove in the room the fire should be raked down, and the necessary fuel for the night provided before anything is done for the patient, also any preparations for the one who is to remain during the night. To prepare the patient for the night and then make up a cot and make a toilet for the night in the sick room is likely to cause the patient to lie awake most of the night.

The prevention of bed-sores is one of the most important points in caring for the sick, requiring intelligent observation and faithfulness to an extraordinary degree, in carrying out details.

The causes of bed-sores are: (1) pressure from the weight of the body upon the bony prominences, such as the end of the spine, the elbows, the heels, the hips and the inner surfaces of the ankles and knees, and in young children sometimes the back of the head; (2) moisture; (3) wrinkles in the bed-clothes; (4) crumbs in the bed; (5) lack of clean-

liness; (6) friction from a rough careless way of putting under or taking away the bed-pan.

The daily routine care of these places should be washing with warm soapy water, drying carefully, rubbing with alcohol and powdering with talcum powder, starch or rice powder. The alcohol and powder should be applied several times in the twenty-four hours, and in cases where the patient is much emaciated there should be frequent (even every waking hour) changes of position with the application of alcohol and powder. The greatest care should be taken after the use of the bed-pan, that the patient may be left perfectly clean and dry.

Large pads made of cotton batting and pieces of old cotton cloth should be provided to put under the hips of the helpless patient, they save frequent changes of the lower sheet which is difficult to remove, and also save the laundry.

When a break in the skin occurs the doctor should be told *at once* that proper orders for its treatment may be given without delay.

These directions may seem to be very troublesome, but in comparison to the suffering caused by a bed-sore they are very slight.

Helpless and Unconscious Patients.—The helpless patient, such as a paralytic, a case of hip-joint disease, fractured thigh, or any condition which

renders the patient unable to turn or lift himself in bed, to sit up or to feed himself, requires extremely good care; first that he may not be reduced to a most unhappy state of discomfort by the necessity of remaining in one position, of being fed like a baby and of needing to be cared for in every detail of his life, a pitiable state of body and mind which naturally causes irritability or depression.

No normal healthy person can realize the misery of such a condition, but if any one wishes to experiment, let him try lying flat on his back with his legs straight in the bed for fifteen minutes without moving, he is a brave man who can resist the temptation to relieve his tired muscles by a change of position before ten minutes have elapsed.

The helpless patient must have the most comfortable bed to be procured, in cases of paralysis the air or water mattress is really a necessity in preventing bed sores. Then there should be at least half a dozen small pillows and pads to slip under shoulders, hips, heels and between knees to relieve pressure and aching muscles. One of the most grateful aids is a small rubber bag two-thirds full of cold water put under a burning aching heel. If a rubber bag cannot be had, get a pig's bladder in the market, wash carefully, fill half full of cold water, fold over the edges and tie tightly with a tape or shoe-string which will not cut. Rubber rings

filled (not too full) with air are provided to relieve pressure upon the buttocks and the end of the spine.

With most helpless patients the circulation is feeble and we say the patient is poorly nourished, and when pressure continues long upon one place bed-sores are sure to follow, consequently care must be taken that the skin is kept clean and dry and the pressure relieved regularly.

Again, with feeble circulation the patient is much more easily burned by hot-water bags or hot bricks; he will not feel the overheated surface as would a vigorous person, and because of the poor circulation his skin will blister much more readily, therefore any extra heat put into the bed of a helpless patient should be thickly covered to avoid the danger of burns. If the skin of a healthy person sustains a slight burn it heals very quickly, but with a patient who is poorly nourished such a burn may become a serious matter and need daily dressing for weeks.

Move and lift the helpless patient slowly. Do not be impatient, do not try to hurry his eating and try to avoid making him feel his dependence.

The especial points in caring for the unconscious patient are in the main the same as those for the helpless patient, except that the evacuation of the bladder and bowels must be observed more care-

fully, as well as the warmth of the body. The hands and the feet may be found cold, and it is in such cases that the danger of burning is greatest. The patient who is burned or develops a bed-sore gives indisputable evidence of poor nursing.

LESSON XII

GENERAL CARE OF A PATIENT

SUGGESTIONS FOR DEMONSTRATION

1. Show bath thermometer and demonstrate its use with water at different temperatures.
2. Demonstrate cleansing bed-bath.
3. Demonstrate bed foot-bath.
4. Demonstrate combing of patient's hair.

The Skin and Its Functions.—The skin is composed of two layers the epidermis or outside covering of the body and the dermis or true skin underneath. There is little or no sensation in the epidermis, but the true skin contains masses of nerve endings by means of which sensations are conveyed to the brain. The outside skin is being constantly renewed from beneath by the growth of new cells, while the worn-out cells are removed from the surface with the perspiration, by the friction of the clothing and by baths. This process cannot usually be seen except in the form of dandruff which is often found on the scalp, but if the body is not kept clean these cells may accumulate and interfere with the action of the skin. Connected with the surface

of the body through the skin are two sets of glands known as sebaceous or oil-producing glands and perspiratory or sweat-producing glands. The oil secreted by the sebaceous glands keeps it soft and pliable and gives it more resistance to injury while the skin forms our greatest protection against many forms of disease and infection. It is therefore most important that the skin be kept clean and unbroken or if injured that it receive prompt attention. In caring for a patient with a discharging wound or any form of infection the person caring for him should frequently examine her own hands and if the skin is broken, even by such a trifle as a hang-nail, the hands should be well washed in warm soap suds followed by some mild disinfectant and the injured place covered at once with a small dressing or collodion. The sweat glands which open through pores over the whole surface of the body consist of minute coiled tubes and are so numerous that if placed end to end it has been estimated that they would reach a distance of more than twenty-five miles. Through these pores moisture is at all times being thrown off and its evaporation regulates the temperature of the body. In addition to this important function, without which life would be impossible, the skin is also an organ of excretion equal in importance to the lungs and kidneys, and waste products, which would act as a poison if

retained in the body, are carried away with the perspiration. So important is the action of the sweat glands that a person can live only a short time if the body is covered with an impervious substance, or the skin destroyed as in burning. The action of the skin is stimulated when we exercise and moisture appears on the surface of the body in the form of perspiration, but if unable to take active exercise, as in the case of illness, special effort should be made to stimulate the action of the perspiratory glands and keep the skin in good condition. The pores of the skin may become clogged not only with the worn-out cells of the epidermis and by contact with dust and dirt, but with the waste products of the body as well if they are not properly eliminated.

Bathing.—Both in health and disease baths are important factors in this elimination, their temperature and method of administration depending upon the purpose for which they are given, and in many diseases they form an important part of the treatment. Special baths should be given only under the direction of a physician and by one especially trained in their use, but it is essential that anyone who assists in the care of invalids should know how to give a simple cleansing bath.

Classification of Baths.—Baths may be either

general or local and further classified according to temperature.

A cold bath—temperature 35° to 65° F.

A cool bath—temperature from 65° to 80° F.

A tepid bath—temperature from 80° to 90° F.

A warm bath—temperature from 90° to 100° F.

A hot bath—temperature from 100° to 112° F.

The temperature of the bath depends upon the condition of the patient and the effect to be produced, but unless definite instructions are given by the physician the temperature of a cleansing bath for an invalid should be from 98° to 100° F., or slightly higher if a bed bath is given, as the sponge or wash-cloth cools quickly when removed from the water. In case of fever a cool or tepid bath may be substituted for the warm bath. A hot bath given at night acts as a sedative often overcoming insomnia and may be given to a patient who is allowed to take a tub-bath, but special precautions must be taken to prevent chilling.

A cleansing bath should be a part of the daily routine in health and is even more important in sickness when the skin is less active and the need of proper elimination is greater, due to the presence of injurious substances sometimes produced by the disease itself. The most favorable time to give a cleansing bath is an hour or two after a light breakfast or just before bedtime and may be followed by

a glass of hot beef tea, broth or milk if the patient seems exhausted.

To Give a Tub-bath.—A tub-bath should never be given to an ill person without the permission of the physician, but if allowed it is the simplest and most satisfactory method. The bath-room should be in order, clean and warm and everything in readiness before disturbing the patient. The tub should be about three-quarters full of water at a temperature of 100° F., and there should be an ample supply of hot towels, the necessary toilet articles and a set of fresh clothing. The patient should be well supported when getting in and out of the bath and the use of a seat placed across the tub will sometimes be found convenient. Wash face, neck and ears first with a wash-cloth kept for this purpose, drying them before proceeding with the bath. Soap the body and rub vigorously using a brush for the feet and hands. The rubbing is essential, not only for purposes of cleanliness, but it stimulates the circulation and prevents a feeling of chilliness on removal from the bath. Place a bath mat or towel on the floor in front of the tub another over a chair where the patient may sit while the body is being dried. When removed from the tub, wrap at once in a warm bath towel or sheet and dry all parts of the body thoroughly with soft warm towels, being particularly careful to dry the

folds of the body and between the fingers and toes. Fresh warm garments should then be put on, covered by a warm dressing gown or blanket and the patient promptly returned to the bed. If he complains of feeling cold extra covers should be provided and a hot-water bottle placed at the feet.

To Give a Bed-bath.—It requires both demonstration and practice to learn how to give a bed-bath quietly and neatly and without unnecessary delay or fatigue to the patient, and in the home care of the sick it is most desirable that some one be able to render this service acceptably. The first step is to get everything in readiness without confusion or bustle and to be sure that the room is sufficiently warm, about 70° F., and likely to remain at this temperature during the bath. If there is any danger of drafts the bed should be protected by screens. Bring all the supplies needed to the bedside and arrange them in convenient order. These supplies should include the following articles—two small blankets, preferably old ones, a square of rubber cloth, one bath towel, two soft face towels, two wash-cloths, one for the face and neck and the other for the body, nail-brush, soap, toilet powder, alcohol, comb and brush, nail file, scissors, etc., with the necessary bedding and body linen placed where it will be warm. Last of all bring a large basin or foot-bath tub partly filled

with water at a temperature of 105° F., or at such a temperature as the patient finds most comfortable. A large pitcher of hot water and a slop jar should be provided and the bath water kept at an even temperature by emptying a portion from time to time and refilling with hot water. When certain that nothing has been forgotten loosen the bedding and move the patient over to the right side of the bed. Turn on one side while placing a single blanket underneath the patient and the other over the covers removing them from below without exposure. The night-gown may then be removed leaving the patient between the two blankets. All the pillows should be taken away but one and this should be protected by a bath towel while the face, ears and neck are being washed. The chest, arms, abdomen, back, legs and feet should be washed in succession drying and covering each portion before proceeding to the next. Warm water should be added before washing the abdomen as this part of the body is especially sensitive to cold. Turn the patient on the side and wash the back and upper part of thighs at the same time separating the folds of the buttocks. Rub the back well with alcohol or alcohol and alum to harden the skin and follow with some simple toilet powder. Return to former position before washing the legs and feet. Knees should be flexed with feet resting on the bed while

washing the legs and if the patient can be easily moved the feet may be held over the water or even placed in it by bringing the basin or tub close to the edge of the bed. An alcohol rub following the bath is refreshing and helps to keep the skin in good condition.

Foot-baths.—Foot-baths are frequently given with or without mustard to relieve congestion in remote parts of the body, for headache, colds and to stimulate the circulation in the lower extremities, using water as hot as can be borne, usually from 105° to 115° F.

To Give a Foot-bath to a Bed Patient.—Loosen the covers at the foot of the bed, turn them back to the knees and cover the feet with a folded blanket. The lower part of the bed may be protected by a square of rubber, but it should not come in contact with the feet. Place upon this a foot-bath tub partly full of water at the required temperature and bend the knees carrying the feet down slowly into the water. If patient complains of the heat cool the water a little and increase the temperature when he become accustomed to it, remembering always that one has no right to ignore the sensations and wishes of a patient when nothing more serious is involved than a little additional labor. Draw the blanket down over the tub, tuck well under the knees and cover by the bedding and additional

blankets if necessary. Hot water should be added as the bath cools, removing a portion if the tub becomes too full, pouring the water in at the side of the tub as far from the feet as possible to avoid burning the patient. The bath should be continued at an even temperature for about twenty minutes and removed without exposing the patient. Rub the feet vigorously until thoroughly dry, place in a blanket with a hot-water bag near and keep the patient well covered. If he seems exhausted and perspires freely the face may be bathed in cool water or a cold compress placed on the head.

Mustard Foot-bath.—If mustard is required use one tablespoonful to each gallon of water placing it in a muslin bag before adding to the bath.

Hot Sitz Bath.—A hot sitz bath is given for local congestion or pain and any tub large enough for the patient to sit in may be used. An ordinary portable wash tub answers every purpose, but a sitz bath should not be undertaken with a helpless patient unless under the direction of a physician. The room should be warm and free from drafts, and the tub somewhat less than half full of water at a temperature of about 110° F., brought close to the side of the bed. To avoid accidents, there should be plenty of help to support the patient and lower easily into the bath. Wrap in warm blankets, at the same time completely covering the tub. If

the water does not reach to the waist line add more of the required temperature. Remove the patient at the end of ten minutes, dry and return to bed, warmed if necessary with hot-water bags.

Sponge Bath for the Reduction of Fever.—Not only does a sponge bath properly given reduce the temperature of a fever patient, but it quiets the restless, soothes the delirious and is usually followed by refreshing sleep. The cooling of the body is caused not only by the lower temperature of the water but by evaporation, and for this reason it is important that the surface of the body be exposed during the bath. Protect the bed by a rubber sheet covered by a cotton sheet or large bath towel and remove the bed covers. Place a towel over the loins, a hot-water bag at the feet and a cold compress on the head, removing the pillow or protecting it with a square of rubber cloth covered with a towel. Begin with a foot-bath tub half full of water at a temperature of 65° to 75° F., and keep at this temperature by changing the water or by adding pieces of ice. A sea sponge may be used, but a large absorbent wash-cloth is better. Sponge the face and neck first, changing the cold compress on the head frequently, and proceed with the chest, abdomen, legs and arms. Sponge with a long, downward, gentle stroke leaving a film of water on the surface, but do not use enough to drip, and

follow by light friction with the free hand to increase the circulation of the blood near the surface. Large blood-vessels are near the inner surface of the arms and legs and the most of the sponging of the extremities should be over this portion. After spending fifteen or twenty minutes on the anterior part of the body turn the patient on the side and sponge the back and upper part of thighs. The bath should not occupy more than a half hour unless definite instructions have been given by the physician. The temperature should be taken both before and at the end of the bath. Avoid all fussiness, confusion or conversation, as any excitement may easily counteract the good effect of the bath. When bath is completed remove the wet sheets by rolling from both sides to the center, to avoid wetting the bed. Turn the patient over on a fresh sheet and dry with soft towels. Cover lightly, unless the temperature is below 100° F., and leave the hot-water bag at the feet for a short time or until the patient has reacted.

Bathing of Infants and Children in Case of Illness.—The general directions given in Lesson VIII should be followed with such modifications as the conditions demand. It may be desirable in case of serious illness to substitute a sponge bath in bed, or in the case of infants in the lap, for the daily tub-bath.

Hot Bath for Convulsions.—Convulsions in children may be caused by even slight disturbances of the nervous system and while they are less alarming than the same condition in adults the attack comes on suddenly and some form of emergency treatment is often necessary. A hot bath is usually given, but this should only be done when it is impossible to secure the advice of a physician. Immerse the child in a tub of water sufficiently deep to cover the chest and place a cold compress on the head, changing it frequently. A high temperature is necessary to relax spasms so the bath should begin at 100° F., or over and the temperature raised by the addition of hot water to about 110° F. This must be done with the greatest care or the child will be burned. The bath should not continue more than twenty minutes or the child should be removed sooner if the convulsions cease. On removal from the water wrap the patient in a warm blanket bathe the face in cold water and continue the cold applications on the head for some time.

Care of the Hair.—There are few things which add more to the discomfort of a patient than a mass of tangled hair, and when confined to bed this condition is unavoidable if the hair is neglected even for a few days, but may easily be prevented if at the very beginning of the illness the hair is parted from the center of the forehead to the nape of the neck, well combed, brushed and braided on either

side of the head just back of the ears. If a patient objects to having the hair braided it may be wound in a soft coil on the top of the head, but there is much more danger of its becoming tangled. If, however, the hair has been neglected, begin at once combing out a little at a time and braid lightly to prevent its becoming retangled. A little vaseline may be rubbed into the scalp or the hair moistened with alcohol while combing it. Begin at the ends and work gradually toward the scalp, holding the hair firmly between the tangle and the head with one hand while combing with the other. Support the head when combing the full length of the hair and do not braid too tightly. Do not attempt too much in one day, but with gentleness and perseverance the worst tangles can usually be removed without injury to the patient.

To Wash the Hair of a Bed Patient.—Dissolve a sufficient quantity of pure soap in hot water to make a strong suds, or use tincture of green soap warmed in a basin of hot water. Move the patient to the side of the bed and place the head on a rubber sheet, carrying the hair well up from under the neck. Arrange the rubber sheet so that the water will run in a slop-jar placed on the floor at the side of the bed and rub the head well with the soap, using enough warm water to make a good lather. Borax may be added in the proportion of

one teaspoonful to a quart of soapsuds. Rinse the hair in several waters, gradually reducing the temperature until the last water is as cool as can be borne comfortably. Dry the hair in hot towels, rubbing the scalp and brushing the hair as it dries. Gasoline should never be used for cleansing the hair.

Pediculi or Vermin in the Hair.—The hair of school children is especially liable to become infested with vermin, but fortunately they are easily destroyed. The hair should be examined frequently, if there is any danger of infestation, and prompt treatment given on the first sign of trouble. If there are only a few vermin they may escape detection, but the nits are easily seen closely adherent to the hair usually at the nape of the neck or behind the ears.

Lice are not only disgusting and irritating, but they may also carry disease from the sick to the well. In this way typhus fever, which exists in some of our large cities under the name of Brill's disease, may be disseminated.

If any are present the hair should be thoroughly saturated with tincture of larkspur and the head wrapped in a thick cloth or rubber cap. Leave for several hours or overnight, follow by an application of warm vinegar to remove the nits and wash well with soapsuds and borax as directed. The head should be inspected daily for some time

and the treatment repeated if necessary. Equal parts of sweet oil and kerosene may be used instead of the tincture and is quite as efficacious.

Care of the Mouth and Teeth.—General instructions for the care of the mouth and teeth in health will be found in the Appendix, page 233, but in sickness it is often impossible for the patient to use a tooth-brush and some other means must be devised to keep the mouth and teeth clean. This is important not only for the comfort of the patient, but in some instances the mouth is known to harbor the germs of the disease, so that its cleansing is a necessary part of the treatment. The mouth and teeth should be cleaned at least twice daily, following the morning bath and the last thing at night, but in some cases will be needed much more frequently, depending upon the condition of the mouth.

Mouth Washes.—The simplest mouth wash and one usually available in any household is one-half teaspoonful of bicarbonate of soda (baking soda) in a glass of tepid water. The same amount of boric acid may be used instead of the soda or two tablespoonsful of Borolyptol or Listerine to a glass of water is agreeable and slightly disinfectant, while lemon and glycerine are often most efficacious.

Lemon-glycerine Mouth Wash.—To the juice of one lemon, strained, add an equal amount of glycerine, mix thoroughly and bottle. For the mouth

wash add one teaspoonful of this mixture to a glass of tepid water. If the mouth is very dry and inclined to crack, albolene, to which a small amount of lemon may be added, is probably the best remedy, or if the gums and tongue are soft, bleeding easily, use a mouth wash of tincture of myrrh one-half teaspoonful to a glass of water. Wrap a piece of cotton or old linen around the index finger or use a piece of whalebone if there is danger of the finger being bitten, dip in the mouth wash and wipe carefully all parts of the mouth and teeth. Change the mouth-wipe frequently, using each piece only once and burn when finished. Clean gently between the teeth with a piece of cotton wrapped around a match or wooden tooth-pick, but in cleaning the mouth never use force enough to make the gums or the tongue bleed. If the patient is able, allow him to rinse the mouth in plain water and apply a simple cold cream or white vaseline to the lips. If the mucous lining of the nostrils is sore or irritated they may be wiped out with a twisted pledget of cotton dipped in plain or carbolized vaseline.

Care of the Nails.—Experiments show that germs are generally found under the nails even of the most cleanly, and in sickness it is especially important that the nails be kept well trimmed and clean, for in the case of communicable disease such as ty-

phoid fever or tuberculosis they may become a source of infection to other people. The cleaning of the nails should be a part of the daily routine, using a nail-brush and warm soapsuds, rinsing in plain water. Clean under the nails while still damp and trim if necessary. If the hands are dry or rough massage with cold cream or a simple hand lotion, pushing the cuticle gently back from the nails to prevent the formation of so-called hang-nails.

LESSON XIII

THE USE OF SIMPLE SICK-ROOM APPLIANCES, LOCAL APPLICATIONS AND ENEMATA

SUGGESTIONS FOR DEMONSTRATION

1. Demonstrate the use of sick-room appliances and substitutes.

2. Demonstrate the use of local applications.

3. Show, preferably by means of a doll, the proper positions and methods of giving enemata to adults and children.

Use of Simple Appliances and Substitutes.—It is often necessary in the home care of the sick to improvise appliances, using materials near at hand, and there is much satisfaction in making a patient comfortable without the expenditure of money for articles which may never be needed again and if kept only serve to remind the family of an unhappy experience. If sick-room appliances must be purchased it is well to remember that simple standard designs are the most satisfactory and that new, untried and elaborate paraphernalia are generally a source of weariness to the patient as well as to those responsible for their adjustment.

Head Rests.—When the patient is able to sit up some form of head rest will be needed and while there are several excellent designs on the market there are none better than the wooden frame covered with canvas or ticking—so constructed that it may be placed at different angles. For temporary use a straight chair may be utilized. Turn

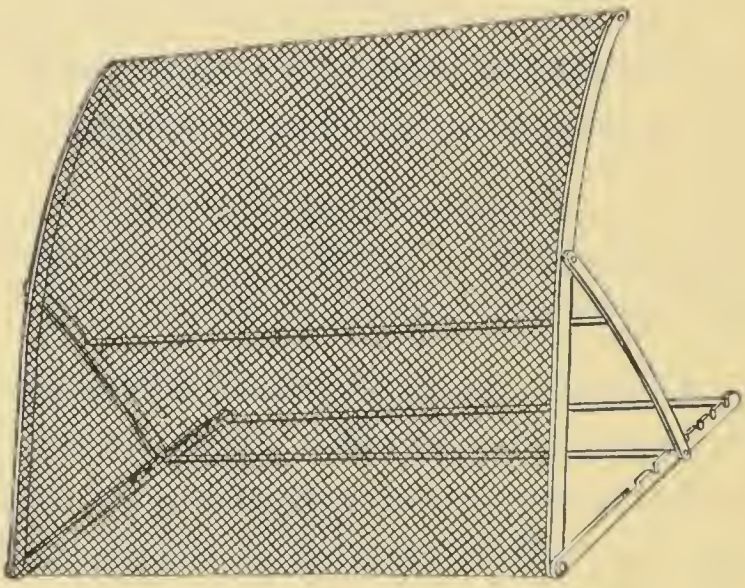


Fig. 14.—Adjustable Bed Rest.

the bottom side up with the feet toward the head of the bed, making an inclined plane upon which the patient may rest.

To Place a Head Rest in Position.—Lift the patient as in changing pillows and draw the head-rest, fixed at the proper angle, underneath the head and shoulders. Cover with pillows placing the first

one under the small of the back and the others behind this with a smaller pillow for the head. When sitting up in bed there is always a tendency to slip down toward the foot, and this may be corrected by the use of a foot rest, knee pad or pillow. A short board well padded may be arranged like a swing for the feet to rest against. Set the padded board on edge at a convenient point and hold in place by tying the ropes of the "swing" to the head of the bed. A pillow may be folded over a strong bandage or piece of muslin and used in the same way either at the feet or under the knees. If properly placed under the knees the patient will sit against the pillow and be prevented from slipping away from the head rest. A round pad six or eight inches in diameter, the length of a pillow and stuffed with some firm material, may be made for this purpose and held in place by strips of strong muslin or ticking sewed to the ends and tied to the head of the bed.

Bed Cradles.—Cradles are used to remove the pressure of the bed covers from sensitive parts of the body and are most frequently needed over the feet or abdomen. If used for one foot alone the cradle should be small enough not to interfere with the motion of the other foot, but if used for both feet it should be sufficiently large to allow some freedom of motion. As the cradle makes an air

space around the feet they are liable to become cold and may be wrapped in a piece of soft flannel, or a hot-water bag used if necessary. If a cradle is used for the protection of the abdomen it should extend a little beyond the body on each side and be high enough to hold the covers entirely free from the abdomen. A barrel hoop cut in two, crossed at right angles, and wound with bandages or strips of muslin, makes a very satisfactory cradle. The size may be reduced by cutting off the ends of the hoops.

Bed Pans.—In all cases of serious illness a bed pan should be provided, for there is no satisfactory substitute. Enamel is somewhat more expensive than porcelain but much lighter in weight and easier to handle. The style known as "Perfection" is now used in most hospitals and there is probably none better for general use, although occasionally when it is undesirable or difficult to raise the patient a slipper bed pan, which is lower and wedge-shaped, may be found more convenient. Many object seriously to the use of a bed pan, but in some diseases it is so important to keep the patient quiet and conserve the strength that every effort should be made to overcome this prejudice.

Use of Bed Pan.—In cold weather the pan should be slightly warmed before giving it to the patient. Flex the knees as in lifting the patient up in bed and

raise the body by placing one hand under the hips while slipping the pan in place with the other. If the patient is absolutely helpless two people will be needed. A small pad may be placed under the back, just meeting the edge of the pan, if the position is uncomfortable. All the pillows except a small one should be removed or there will be too much pressure on the pan and the contents may run out. This accident may be further prevented by placing a folded newspaper or pad under the edge of the pan thus elevating the back of it slightly. Raise the patient carefully when removing or hold the pan firmly and turn him on one side. The pan must be inserted and removed gently or the back may be bruised and a bed-sore result.

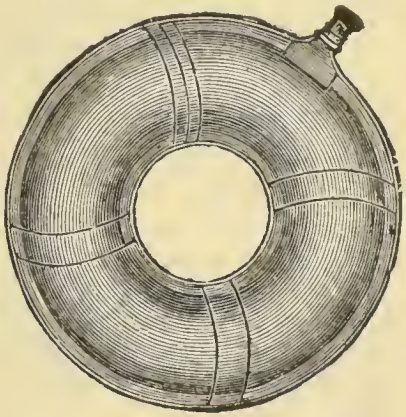


FIG. 15.—RUBBER RING.

Urinals are used only for men, and those made of glass are most hygienic, as the interior can be easily seen and readily kept clean.

Rubber Utensils.—All articles made from rubber are expensive and easily injured by improper use.

Rubber air rings are used for the relief of pressure and are a necessity if there is much tenderness over

the end of the spine, the most frequent place for the development of bed-sores. An air ring should be just full enough to prevent the portion of the body supported by it from coming in contact with the bed, for if too full they are uncomfortable and may themselves form new points of pressure. If there is the slightest leak the ring will soon become flat and useless. Wind smoothly with bandages after filling with air or place in a muslin case.

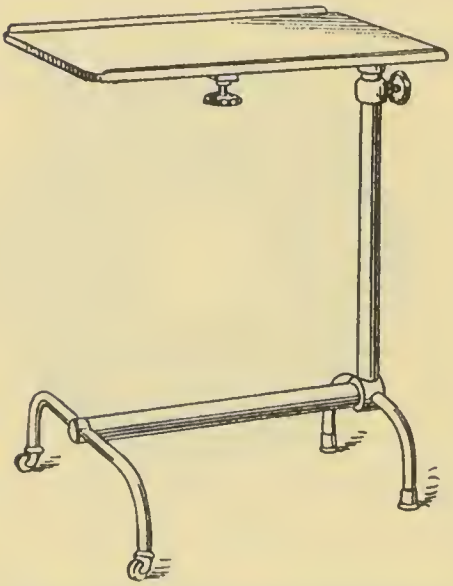


FIG. 16.—ADJUSTABLE TABLE.

Cotton rings and pads may be made from ordinary cotton batting wound with bandages or covered with muslin and are useful to remove pressure from the heels, elbows, shoulders, head or any part of the body where a small area needs support.

Adjustable Tables.—A table supported from one side so that it will extend over the patient's lap will be found a great comfort when one is able to sit up in bed, or small tables supported by short legs can also be procured and may be placed directly on the

bed. A satisfactory substitute can easily be made at home from a wide board with supports six or eight inches high nailed to each end.



FIG. 17.—FOLDING BED TRAY.

LOCAL APPLICATIONS

Local applications to the surface of the body are so generally used that any one assisting in the care of the sick should have some knowledge of the simpler forms and the methods of applying them.

Dry Heat.—Hot-water bags are most frequently used for external warmth, and while found in nearly every household, serious accidents may follow their

use unless safeguarded by the necessary precautions. They should never be filled with water hot enough to burn and before placing them in the bed should be slipped into a cover which closes with a draw string. They should not be filled more than half full and the air expressed by placing the bag on a flat surface before screwing in the stopper.

Bricks heated in the oven, strong bottles or jugs filled with hot water and securely corked may be used instead of the hot-water bags, but they must be well covered and not placed too near the patient. Hot-water bottles should never be placed between the feet or legs. One of the safest ways is to put three or four quarts of coarse salt or sand into a pan in the oven until it is hot but not burning; divide into two bags or pillow-cases and place in the bed on top of the first blanket which covers the upper sheet. Salt or sand retains the heat for a long time; there is no danger of escaping steam or hot water, but like all extra heat added to a patient's bed *it must be watched*.

Hot, dry flannel will sometimes give sufficient warmth to relieve pain, especially with babies, and can be used without any fear of burning. It may be heated on a register or radiator or in an oven, but must be applied quickly and will retain the heat longer if covered with oiled silk or waxed paper.

Moist heat is often applied in the form of fomentations (stupes) or poultices and to avoid burning must be used with even greater care than dry heat.

Hot fomentations or stupes, to be effectual, must be properly applied and frequently renewed. Some arrangement for heating water must be brought near the bed and so placed that there is no danger of fire. Have ready two pieces of soft flannel three or four times as large as the area to be covered, a stupe cover of some impervious material such as oiled silk, rubber cloth or waxed paper, another cover of flannel or absorbent cotton, a stupe wringer and a basin half full of boiling water. A heavy roller towel may be used for the wringer, or one may be made from strong ticking with a wide hem at each end through which pieces of broom handle may be run, pushing the cloth to the center of the handles to form a little pocket. Lay the wringer over the basin and place in it a piece of the flannel, pushing both well down into the boiling water. When thoroughly saturated remove and wring quickly, twisting the ends of the wringer in opposite directions. The flannel should be wrung as dry as possible and lightly shaken to allow the steam to escape. Apply as hot as can be borne, but if patient is unconscious the heat must be tested with the back of the hand or bare arm.

Turpentine stupes are used as a counterirritant,

but should never be applied without definite orders —as a patient may easily be blistered if the turpentine is carelessly used. One teaspoonful of turpentine should be sprinkled over the flannel before placing it in the water as this helps to distribute the turpentine evenly, but the following is probably a safer method:

For an adult mix thoroughly one part of turpentine with five parts of sweet oil or olive oil and for a child one part of turpentine to ten parts of oil; rub this mixture gently over the part before applying the hot flannel. The turpentine should be used only for every third or fourth application or the skin will become irritated. When the fomentations are discontinued the part to which they have been applied should be covered with warm dry flannel or absorbent cotton.

Poultices.—A poultice is frequently used when long continued moist heat or counterirritation is desired. Flaxseed is the most common basis for a poultice, although many other substances may be used.

To Make a Flaxseed Poultice.—Have enough boiling water to make a poultice of the required size; to this add slowly ground flaxseed stirring constantly to prevent its burning or lumping. When thick enough to drop from the spoon or knife, remove from the fire and beat thoroughly. Spread

about one-half inch thick, on a piece of old muslin or thinner if applied to a sensitive portion of the body, and fold the edges over on all sides so that the poultice cannot escape. Apply the under side of the poultice, or fold the edges of the muslin over about two inches and cover with a piece of gauze several inches larger than the poultice; apply the gauze side to the body and fold the edges back. Carry to the bed-side on a hot plate or wrapped in a hot towel. Test carefully against the back of hand or cheek before applying and lower gradually so that patient may become accustomed to the heat. Cover with absorbent cotton and hold in place with a bandage or binder. A poultice should ordinarily be removed at the end of an hour, the skin dried with a soft cloth, and if no more are to be applied substitute a pad of absorbent cotton or a piece of soft flannel.

Mustard poultices are prepared the same as a flaxseed poultice, adding the mustard just before it is spread, the proportions depending upon the sensitiveness of the skin and whether a quick action is desired or a more long continued effect. Unless definite orders are given by the physician the proportion should not be more than one part of mustard to six parts of flaxseed and even less for children or unconscious patients. Before adding to the poultice make certain that all lumps are care-

fully broken and mix thoroughly. A mustard poultice should never be left on long enough to blister, and a thickness of muslin or gauze should always be placed next to the skin. Watch carefully and remove as soon as the skin is well reddened, usually at the end of fifteen or twenty minutes. If the skin is especially sensitive, the white of an egg or some form of oil added to the poultice will lessen the danger of blistering.

Cold Applications.—The local application of cold contracts the blood-vessels near the surface, thus reducing the supply of blood and lessening congestion. Through its action on the nerve endings it also has a tendency to relieve pain. The local effect of cold is frequently secured by means of ice either in a poultice, ice cap or ice coil, but they should only be used under the direction of a physician or by some one trained in the method of their application.

Cold compresses may, however, be safely applied when their use is indicated.

A cold compress for the head is generally acceptable in case of fever and some forms of headache, and will often quiet a restless patient. An old handkerchief or piece of soft linen may be used and should be folded with the raw edges inside and large enough to cover the forehead without wetting the hair or pillow. At least two compresses should be

provided, keeping one on a block of ice while the other is in use. The ice will melt less rapidly if suspended in a piece of gauze tied over the top of a basin. A little water may be poured over the compress after placing it on the ice if it is not sufficiently moist.

Cold Compresses for the Eyes.—A soft material should be selected, preferably sheet lint, and a separate compress used for each eye if both are being treated. The compresses should be cut only a trifle larger than the eye and fit neatly over it. Place several on a block of ice and renew frequently. If there is any discharge from the eye use the pieces but once, collecting them in a covered receptacle or waterproof paper and burn. Eye compresses should be changed every few minutes, but definite directions concerning the frequency of changing and the length of time the application should be continued will usually be given by the physician.

Liniments are used to produce a mild counterirritation and are chiefly valuable for the friction with which they are applied. Liniments should be well rubbed in with the palm of the hand and the general direction of the rubbing should be from the extremities toward the heart.

Their action will be increased if the surface is washed with warm soap and water before using and

covered afterward with warm flannel or absorbent cotton held in place by a light bandage.

Plasters and ointments are common household remedies, but those containing active drugs should not be used unless ordered by a physician. Plasters should be slightly warmed before applying and if there is difficulty in removing them a little turpentine or oil may be rubbed along the edges.

ENEMATA

The waste products of digestion are carried away through the large intestines and it is essential that there be no obstruction and that the bowels be freely opened at least once a day. In health this can generally be regulated by proper attention to the diet, but in sickness the administration of an enema is often necessary.

As the intestinal tract has the power of absorption it is possible to introduce nourishment, medicines or water into the system through the rectum. This is also done by means of enemata and they are used for various purposes, the most common being —to relieve pain or flatulence, to expel or destroy worms, to destroy germs, to check diarrhœa, to act as a sedative or a stimulant, to relieve thirst or to afford nourishment to the body. Such enemata should only be given by the direction of a physician, but the mother of a family or any one helping in the

care of the sick should know how to give a simple soapsuds enema.

Directions for Giving a Simple Enema.—All the articles required should be collected and conveniently arranged before beginning. Have ready—a douche bag or Davidson's syringe with nozzle, or, better still, a soft-rubber tube or catheter, a commode if the patient is allowed to get out of bed or if not a bed pan, towels, a rubber sheet to protect the bed, a pitcher containing at least a quart of soapsuds at a temperature of 105° to 110° F. and vaseline or sweet oil to lubricate the nozzle. Remove all pillows from under the head, unless possibly a small one if the patient is uncomfortable, and all covers except a sheet and blanket. Place the rubber sheet, covered by a towel or soiled sheet, under the patient and turn on the left side with the knees flexed. Owing to the formation of the lower bowel and rectum an enema can be given more satisfactorily in this position, but if necessary the patient may be left on the back with the knees elevated. To prevent injecting cold water and air into the bowels allow the water to run freely through the tube before inserting it. Pass the oiled nozzle or rubber tube gently into the rectum and withdraw a little if there is any obstruction, inserting again. Allow the water to run slowly, using as little force as possible, and wait a moment

if the patient complains of pain. The action of the enema is more certain if retained for a time, but if absorbed, as occasionally happens, repeat in an hour or two. A bland soap, such as Castile or Ivory, should always be used in preparing an enema, as an ordinary yellow soap contains irritating alkalies which would be injurious to the intestines.

To Give an Enema to a Child.—The same general directions may be followed with children, but it is even more important to use a flexible tube instead of a nozzle, especially if the child is restless. For infants a small syringe consisting of a soft-rubber bulb with a nozzle is excellent when only a small amount of fluid is to be given, but one must be certain that the bulb is full of water, or air will be introduced causing pain.

The amount of fluid to be used depends upon the age of the child and the purpose for which the enema is given, but from one-half pint for a small baby to one and a half pints for older children may be considered a safe average if no instructions have been received.

In washing out the bowels several quarts are sometimes given, but this should never be undertaken unless under the doctor's directions.

LESSON XIV

SYMPTOMS OF DISEASE

SUGGESTIONS FOR DEMONSTRATION

1. Demonstrate taking the pulse, temperature and respiration.
2. Show how to care for a thermometer.

Symptoms are the danger-signals of disease and are divided into two classes, those felt by the patient, which are known as *subjective*, and those seen by the doctor or nurse, which are known as *objective*.

The most important *subjective* symptom is pain, and in describing this symptom to a doctor one should try to be very accurate, using the patient's own language. There are three points to be especially observed, (a) locality of pain, (b) character of pain, which may be dull, sharp, stabbing, throbbing, continuous, slight or severe; (c) time at which pain is worse; certain diseases are characterized by severe pain at night. Notice should be taken whether the pain is relieved by change of position.

It should be remembered that pain often occurs far from the lesion which causes it, which is explained by the branching nerves; for instance, a dislocated shoulder may cause a severe pain in the elbow.

Sensitiveness to light, failure of vision and spots before the eyes are subjective symptoms.

The **mental condition** of the patient should be noted, whether it is normal or depressed, or restless or dull or excited, or wandering, or delirious, or unconscious. Hasty judgment of the mental condition should be avoided particularly where there may be a question of hysteria.

It is not amiss in speaking of the mental state of patients to urge upon the mother or home-nurse the necessity for early treatment in all cases of mental disturbance. The responsibility should be put upon the very best medical adviser to be obtained and not delayed until it is too late. It is a common occurrence for families to consult all of their relatives and neighbors in such cases before calling in the specialist, which should be reversed. If any thing can be done for these unhappy patients it must be done *early*.

Sleep should be carefully noticed. The word of the patient is not sufficient evidence, and the duration and character of the sleep should be observed; whether it is quiet or the patient cries out in sleep,

this should be especially noted in children, and whether the patient breathes through the nose or mouth.

The **appetite** or absence of appetite should be noted, and the amount and character of food taken. Thirst and nausea are subjective signs.

Loss of a sense of *smell* or *hearing* often occurs in colds and infectious fevers. Sensations of *cold* or *heat*, which may be due to chills or fever, or manifestations of nervousness may be described by the patient. The complaint of chilliness may be of serious import and should always be accurately noted as to the time, duration and degree of severity.

Fatigue which is seemingly without cause, may also be an important indication, normal fatigue arising from physical exertion is natural, but a general lassitude and exhaustion from slight exertion is quite another thing, and especially if there is a dull mental state as well.

The observation of **objective** symptoms requires training and long experience and is one of the most important duties of nurses. There are, however, many *objective* symptoms which any intelligent person sees, for instance is the patient's body wasted or well nourished?

Is the *expression of the face* normal or drawn with pain, or swollen, or puffy under the eyes? Is the

complexion pale or flushed or bluish or yellow, or bronzed?

Is the *skin* dry or moist, hot or cold, harsh or soft, are there any eruptions present? The lips may be pale or bluish, or dry and cracked or fever-blisters may be present.

The **eyes** may be sunken or prominent, or blood-shot or with inflamed lids, the pupils may be dilated or contracted or unequal in size or there may be squint.

Signs of **ear** trouble may be pain, discharge, headache, or swelling about the ear, deafness, inattention, stupid expression or imperfect articulation.

The **posture** of the patient may indicate the source of his ailment. The baby with colic or the patient with a painful abdominal trouble draws up his knees because he is more comfortable in that position. A child with hip disease cannot lie with his painful thigh fully extended.

Patients with pneumonia or pleurisy on one side, usually lie on the affected side, because that position allows the healthy lung to expand and give them more air. In many forms of heart disease the patient sits upright in bed as he cannot breathe while lying down. The nervous picking of the bed clothes, twitching of muscles and hiccough should always be noted. A patient suffering from ex-

treme weakness usually lies very quietly, with an inclination to slip down in the bed.

The variations in the rate and character of *respiration* present many symptoms. The normal rate of breathing in an adult is from 18 to 20 times per minute, from 25 to 35 in an infant and from 20 to 30 in a child. To count the respiration of a baby place the hand lightly on the abdomen, preferably while the child is sleeping. In counting the breathing of an adult it is better to do so unobserved by the patient, because he may be nervous and the rate disturbed. The rate varies to a great degree; in pneumonia the respirations may be as high as 60 per minute and on the contrary in opium poisoning the rate may be as low as 7 per minute. While counting the breathing, note the regularity or irregularity, whether the respiration is made by the chest or abdominal muscles, whether it is easy or labored, or painful. Mouth breathing indicates some obstruction in the air-passages, usually adenoids in children, which should be corrected. A child who habitually breathes through the mouth should be put under the doctor's care without delay.

The **cough** when present should be noted as to character, whether dry or accompanied by expectoration, painful, frequent, loud or whooping and worse by day or night. The sputum may be yel-

low, white, gray, rusty, blood-streaked, dark or frothy. The amount should be noticed.

The **pulse** is the record of the rate and character of the beating of the heart. The rate is more frequent in old age and infancy, and in a normal adult should be about 72 per minute.

To count the pulse place the ends of the second and third fingers over the artery of the patient's wrist nearest the thumb, but do not make too deep pressure. Count for half a minute and multiply by two, rather than count for a full minute. These directions sound very simple, but in reality counting the pulse is extremely difficult, except in perfect health because the rate, force, volume and rhythm vary to an extraordinary degree; it is not uncommon for a young nurse to count a patient's pulse several times and get a different result each time.

The **normal body temperature** of the adult is 98.4° Fahrenheit and from one-half to a degree higher in infancy. The temperature of children, like the respiration and pulse, is more easily disturbed than in adult life, a slight cold or an attack of indigestion will elevate a child's temperature to an alarming degree.

The variations of the temperature are described as follows:

98.4° F.—normal.
98° F.—subnormal.
100°–105° F.—fever (pyrexia)
105°+ F.—hyperpyrexia.

To obtain the temperature of the body a clinical thermometer is needed.

Never use a cheap thermometer—they are always unreliable and may record extraordinary variations of temperature which are false.

The thermometer should be kept clean by washing in lukewarm water and wiping on a clean soft cloth. Shake the thermometer until the mercury falls below the normal (98.4°), place under the patient's tongue and have him close the lips tightly for two minutes. If the patient moistens his lips before taking the thermometer he is more comfortable and there is less likelihood of air entering around it which might lower the record.

The temperature may also be taken under the arm (axilla) or by rectum, but these methods are not usually employed except in extreme illness. A baby's temperature however is always taken by rectum. A thermometer used for rectal temperatures should be kept apart from mouth thermometers.

There may be variations of temperature in health as well as in disease, the temperature is usually lower about 2 a. m. than at any other time in the twenty-four hours.

The child's normal body temperature is one-half to one degree higher than the adult, while in the old the temperature is often somewhat lower.

After eating the temperature may be slightly higher and following profuse perspiration there is usually a slight fall.

The variations of temperature in disease depend upon the nature of the illness and the temperament of the patient. Persons of nervous temperament are liable to have a rise of temperature from very slight cause,—even from a peevish fit of temper—while the more sane self-controlled patient has a temperature not easily disturbed by slight circumstances.

In exhausting illness like typhoid fever, however, any excitement will frequently result in an alarming increase of temperature.

A low temperature (subnormal) is observed following the course of a fever. A fall of more than one degree below normal would be taken as a grave indication while a rise of one degree might occur from a simple ailment. Thus it will be seen that the innumerable variations of respiration, pulse and temperature can be discerned only after long training and experience. It is not uncommon to have nurses say that they had been two years or more in training before they lost their fear of inaccuracy in taking the pulse, temperature and respiration of a desperately sick patient, and if this is true of those who devote their whole time to the care of the sick it cannot be expected that

the mother or home-nurse can recognize or report upon such difficult conditions.

The **tongue** in health is pink and moist and when put out for observation it is somewhat pointed and the person holds it steadily; but it may be coated either white, yellow or brown, all over or clean on the edges, or dry and parched; in scarlet fever it is a vivid red known as the strawberry tongue; it is sometimes ulcerated, and in many exhausting illnesses it is flabby and trembling. The odor of the breath may be due to decay or neglect of the teeth, or to indigestion and constipation, or to nasal catarrh, or to special diseases.

The **throat** is sometimes red as in simple sore throat or in scarlet fever, or there are white patches sometimes resembling membrane, or there is true membrane, or swollen tonsils and in measles the eruption may show on the soft palate before it appears on the skin.

The **gums** may be swollen, tender or bleeding or a blue line may be present indicating poisoning from mercury, lead or bismuth. Sordes often covers the teeth and gums.

The **voice** is often much altered and may be hoarse or whispering. Lost voice (aphonia) may be due to inflammation or other disorders, or to hysteria.

Speech may be clear or thick. Lost speech

(aphasia) may be due to apoplexy or paralysis of the vocal cords.

Nausea and vomiting may occur directly after meals or in the morning. The character of the vomitus may be food, curdled milk in babies, bile, blood-streaked, coffee-ground appearance, or fecal when there is obstruction of the bowel.

The act of vomiting may be quiet and without effort or loud and straining, or violent, called projectile vomiting.

The **abdomen** may be distended and board-like, particularly on one side and tender to the touch.

The **feces** may be normal, or soft and yellow as in typhoid fever, or light clay-colored and hard, or small and watery with mucus and blood-streaked, or green and slimy with curdled milk as in babies with indigestion, or dark brown or black in color. When the feces present any unusual appearance or have an offensive odor, the discharges should be saved for the doctor to see.

Intestinal worms may be found; round worms, thread worms or pieces of tapeworm.

The **urine** in health is clear, amber, slightly acid, and from 30 to 50 ounces are excreted in 24 hours; the amount varies from the amount of fluid taken, or from the season,—during warm weather the skin is very active which lessens the work done by the

kidneys and on the contrary in winter the amount of urine is greatly increased.

The urine may be scanty and high colored, or scanty and cloudy, or contain mucus or blood, or there may be a bright reddish deposit upon standing.

An extremely important point, very often overlooked in the home care of the sick, is that urine should be voided regularly and the amount noted. An overful bladder or no secretion of urine both need immediate attention.

Incontinence of urine means the involuntary emptying of the bladder. *Retention* of urine means that the urine has been secreted by the kidneys, but for some reason is retained in the bladder. *Suppression* of urine means that the kidneys do not secrete urine, and is an alarming symptom.

The loss of weight in adults, and the failure to gain in weight in infancy and childhood, are danger-signals to be heeded as soon as recognized.

Contagious Diseases.—Some notes on the common contagious diseases may prove helpful to the mothers whose children are liable to exposure at school.

Those with characteristic rash (eruption) are measles, German measles, scarlet fever, chicken-pox and small-pox.

Those without rash are mumps, whooping-cough, and diphtheria.

The time which elapses between the exposure and the onset of symptoms is known as the period of incubation and varies with the disease.

Incubation Period of		Period of Quarantine
Measles	11–14 days	Highly contagious in early stages. Two or 3 weeks or until discharges from nose and throat have ceased.
German measles	5–16 days	One week.
Diphtheria	Not known	Until culture from throat is negative.
Chicken-pox	14–16 days	Until all scales have fallen off.
Small-pox	7–21 days	Until all scales have fallen off.
Mumps	7–20 days	Ten days to 2 weeks.
Whooping-cough	7–14 days	Until whooping ceases.
Scarlet fever	2– 5 days	Until peeling ceases.

Measles: Onset gradual, cold in head, running nose and eyes, teasing cough, sensitive to light, fever, blotchy, mulberry colored rash beginning on forehead behind ears, and face or sometimes first seen on soft palate.

Diphtheria: Onset sudden or gradual, fever slight, pain on swallowing, lumps at side of neck or angle of jaw, running nose with bloody discharge or crusts, exudate (membrane) on tonsils, palate or pharynx.

Scarlet fever: Onset sudden usually with vomiting, flushed face, headache, fever, sore throat, tongue may be coated or very red (strawberry tongue), rash is fine, diffused and first appears on chest and neck, a child looks and acts sick. Rash lasts 3 to 7 days, peeling may continue for 6 or 8 weeks. (New York Public School Bulletin.)

Early Treatment of Certain Diseases.—The necessity for the early treatment of mental disturbances has been spoken of, and there are two other common maladies which might be over come by early treatment, but are often delayed until the harm done is too great to be corrected, viz.: tu-

berculosis and cancer. In both instances the hope lies in early treatment.

Tuberculosis is an infectious disease due to the tubercle bacillus and may affect any part of the body. In young children it is often seen in the hip-joint or vertebræ or the glands of the neck, while in young adult life it more commonly appears in the lungs. The disease is rarely, if ever, hereditary but the predisposition to it is common. Confinement in dark poorly ventilated over crowded rooms, lack of food and sunshine all contribute to the causes of tuberculosis. In the most common type, pulmonary tuberculosis, the infection first manifests itself in the upper part (apex) of the lung. The symptoms come on gradually, a hacking cough often scarcely noticeable, loss of weight, increased expectoration, daily rise of temperature in the afternoon and night-sweats. A dry climate and an outdoor life with abundant nourishing food cover the special treatment, but if these are delayed until the disease has made extensive inroads upon the lungs the treatment has little effect. Many tuberculosis patients are successfully treated at home, but in all instances the patients are either children with intelligent, faithful mothers or nurses; or adults who co-operate with the doctor; without co-operation the doctor is helpless. It should be borne in mind that the sputum is infective material

and it should be received in paper cups made for the purpose; the paper cups are best because they may be burned. Paper handkerchiefs and paper napkins in abundance are much safer than other kinds because they are burned and not handled.

Cancer unfortunately is often far advanced before any characteristic symptoms are noticed; this is especially true in cancer of the uterus, and the first symptom noticed will be hemorrhage. Every woman should know this, and when an unaccountable flowing occurs should be examined without delay, because every day is of importance should the hemorrhage be caused by cancer. Cancerous tumors such as those of the breast are recognized earlier, as the tumor may be felt and seen, and is often accompanied with sharp shooting pain. The especial point to be remembered is that the earlier the treatment, the better the result.

LESSON XV

THE HOUSEHOLD MEDICINE CLOSET

SUGGESTIONS FOR DEMONSTRATION

1. Show stale drugs, both fluid and in pills or tablets.
2. Show accurate measurement of fluids. Emphasize danger of inaccuracy.
3. Show how to label bottles and how to avoid soiling them.
4. Demonstrate how to clean and care for—(a) throat spray, (b) hard-rubber syringe, (c) fountain syringe.
5. Demonstrate how to sterilize basins, scissors, needles and other small surgical instruments.
6. Demonstrate ways of giving (a) castor oil, (b) powders in wafers, (c) capsules.

In every household there should be a small wall cupboard for medical and surgical supplies. This should preferably be placed in the bathroom or "mother's" bedroom and should be provided with a key for the use of adults.

The best bottles for a family medicine closet are square two-ounce bottles with glass stoppers. The bottles should be uniform and plainly marked; bottles of this kind take up little room and being

small prevent an accumulation of stale drugs, which are dangerous. Poisonous drugs should be put into rough glass bottles with red labels.

The following list of contents for the home medicine closet has been compiled from experience and from the First-aid Text-book of Major Charles Lynch, U. S. A.:

Alcohol.
Whiskey or brandy.
Aromatic Spirits of Ammonia (rubber cork).
Castor oil.
Epsom Salts (or ½ doz. Seidlitz Powders).
Lime water.
Olive oil.
Mustard, powdered.
Sodium Bicarbonate.
Syrup of Ginger.
Syrup of Ipecac.
Witch-hazel.
$\frac{1}{10}$ grain Calomel tablets (small bottle, 50–100 tablets).
5 grain Bismuth Subnitrate tablets (100).
5 grain Cascara tablets (50 to 100).
Carbolized Vaseline (1 glass jar).
1 drachm bottle Oil of Cloves (labeled "Poison").
1 bottle 50 Soda Mint tablets.
1 tin Talcum powder.
White Castile soap.
½ pound absorbent cotton.
6 Gauze Roller Bandages (3 large and 3 small).
2 U. S. Army First-Aid Dressings.

1 roll oiled silk.
1 roll old muslin.
1 roll adhesive plaster, ½ inch wide.
1 small bottle collodion, with brush.
1 box tooth-wax.
1 box tooth plasters.
1 box corn plasters.
1 sharp knife.
1 pair scissors.
1 teaspoon.
2 bent glass drinking tubes.
Pins, ordinary and safety.
1 eye bath.
1 throat spray.
1 fountain syringe and glass points.
1 spirit lamp (where there is no gas).
Cold cream or hand lotion for chapped hands.
Lip salve, equal parts of lanolin and vaseline.

The last-named articles should be used freely upon school children in cold weather, to save them from discomfort as well as from possible infection.

A word about the fountain syringe—*it should be kept clean inside and out.* The glass points should be washed in cold water followed by hot soapsuds, followed by boiling each time they are used, and always before using again. The rubber bag and tubing should be scrubbed with hot soapsuds, rinsed in clean hot water, drained and wrapped with the glass points in a clean towel before putting

away. The ordinary fountain syringe hanging for months by a dirty string on a nail in the ordinary bath-room is a dangerous object.

Danger of Stale Drugs.—When a liquid drug stands for months even in a well-corked bottle there is always a certain amount of evaporation of the fluid which alters the strength, because there is less fluid to the amount of the drug. For instance tincture of iodine is often used as a local application and when the tincture is freshly made may be applied to the skin daily with only a mild irritation; but the tincture which has been standing for months may become so strong, from the evaporation of the alcohol it contained, that one application would produce a serious burn.

Pills and tablets also deteriorate by standing, some of them becoming so hard they may pass through the stomach and intestines without dissolving.

At least twice a year the medicine closet should be gone over and everything stale or broken taken out and at all times should be kept scrupulously clean and orderly.

Stimulants and Patent Medicines.—The indiscriminate practice of using patent medicines and stimulants which is so common is one to be deplored as dangerous. The treatment of any patient cannot be properly determined until a diagnosis has been made; guessing at the cause of illness by

untrained persons, who prescribe patent medicines, is so lacking in intelligence, and so full of risk that it should never be done. Prescriptions which have been used during an illness should not be kept indefinitely nor used for another patient.

Accurate Measurement.—A teaspoon of a different pattern than those used at the table should be kept in the medicine closet for the sole purpose of measuring fluid drugs. The graduated medicine glass is dangerous in the hands of the inexperienced. A small drinking glass is also a necessity. After the medicine has been measured in the teaspoon it may be put into the glass and diluted with water sufficient to take away the strong unpleasant taste.

In pouring liquid from the bottle always pour from the side opposite the label which will save the label from becoming soiled, and always wipe the neck of the bottle before returning the cork.

Read the order and the label both before and after measuring. Medicines, spoons and glasses should preferably be kept in an adjoining room and all measurements made in the same place. The practice of keeping drugs upon a bedside table is undesirable, as the delirious patient may take the drug or may throw it upon the floor.

Spoons and glasses should be washed at once after using.

The administration of medicine by mouth is the most common method and unless otherwise ordered is always understood.

Except the various oils, medicines are diluted with water, unless otherwise ordered. Sufficient water to make the drug more palatable is all that is necessary, except in case of fluid preparations of iron and of the dilute acids, which should be largely diluted.

To make oils palatable they may be given with orange-juice, sherry, or brandy, or the oil may be shaken into an emulsion with double the quantity of hot milk or black coffee. In giving oil put the other fluid into the glass first and pour the oil into the middle of the fluid which prevents the oil sticking to the sides of the glass, and at the same time be very careful of the measurement.

A piece of ice held in the mouth just before taking a disagreeable drug will lessen the bad flavor, and sucking a slice of orange or lemon after the dose will help to take away the disagreeable after-taste.

Pills, capsules and tablets should be swallowed with water to dissolve them. Unpalatable powders and pills or tablets may also be taken in jam or honey followed by a drink of water.

Every medicine closet should contain a glass drinking tube for use with such drugs as discolor or injure the teeth. There should also be a drinking tube for taking milk or broth or other fluids when

the patient cannot be raised up in bed. These tubes should be thoroughly cleansed immediately after use and the diet tube should be kept apart from the medicine tube.

Drugs are administered by rectum in the form of suppositories which are small cones of cocoa-butter containing the drug. The suppositories melt at body heat and should be kept on ice in hot weather. The suppository should be oiled with vaseline and inserted as far as the finger can be introduced, the patient lying on the back or left side.

Inhalation for a stimulating effect is commonly used in case of fainting when the ordinary smelling salts are employed. In giving smelling salts care must be exercised in not putting the bottle too near the nostrils, the strong fumes are very painful and cause a spasmodic effort to get the breath which is particularly undesirable.

Inhalations are often used for action upon some part of the respiratory system, as in asthma, croup or bronchitis. The drugs may be used dry as smoke or given in steam.

Special croup-kettles are made for inhalation by steam, but a gas stove or spirit lamp, a tea-kettle with five or six feet of rubber tubing attached to the spout and with a funnel at the end may easily be contrived to answer all purposes. Clothes-bars and two sheets may be made into a tent over the

upper half of the bed, the gas stove should be on a table outside of the tent and at least four or five feet away from the tent to avoid the danger of fire, and the funnel and tubing may be carried under the edge of the tent. In hospitals regular tent frames are kept for this purpose, but the home-made tents and kettles are just as effectual if properly managed.

When continuous inhalation is not necessary the drug may be added to a pitcher half full of boiling water and a towel adjusted around the top and covering the patient's nose and mouth.

Spraying and gargling are often employed to apply drugs to the throat and nose, but should not be done except by the doctor's orders.

Inunction or rubbing into the skin is often ordered for delicate babies and young children. Cod-liver oil or olive oil is commonly used and applied to the abdomen. The skin should first be washed with warm soapy water and thoroughly dried, and the oil applied by the palm of the hand in a circular movement. The oil should be warm and the rubbing continued until it is absorbed. Certain drugs are sometimes administered by inunction but such orders are not for the home nurse.

Records.—If medicines are to be given at regular hours and the pulse, temperature and respiration taken and recorded, a simple record sheet may be easily made of foolscap paper.

RECORD

DATE	HOUR	TEMP.	PULSE	RESP.	DIET AND MEDICINE	B. M.	URINE	REMARKS
1913								
Jan. 1	4 p.m.	100°	76	24	Medicine			
	5 p.m.					1	℥vii	
	6 p.m.				Supper { Baked potato, toast, fruit, tea			
	8 p.m.				Medicine			Sponge bath
	9.30 p.m.							Asleep
Jan. 2	3 a.m.						℥ix	
	8 a.m.	99°	74	22	Medicine			Patient slept most of the night
	8.30 a.m.				Breakfast { Cereal, orange, toast, coffee			
	9 a.m.				Bath			
	9.30 a.m.							Sat up 2 hours

If medicines are not given at the regular time the dose for the next time should never be increased.

Care should be taken that the hour and the record should correspond, from the above it may be seen that the patient's pulse, temperature and respiration were taken at 4 p. m., that there was a bowel movement and urination at 5 p. m., etc. The amateur nurse is usually too economical of space and "huddles" her records so closely they are difficult to decipher.

The doctor will usually write his orders either on the record sheet or to be attached to the record for reference. It is better that the record should not be kept in the patient's room, and that knowledge of what it contains should not be given to the patient, nor discussed in his presence. The patient's room is not the place for the relatives to "talk things over."

All unusual symptoms should be recorded such as chills, pain, sleeplessness, coughing, nausea, vomiting, delirium, night-sweats.

When a chill occurs, the temperature and pulse should be taken and recorded at once, and again in an hour.

Remember that the record is not the place to state your opinions, but is for recording facts, and that it should be as simple and concise as is possible in making an intelligent report.

APPENDIX

BOOKS OF REFERENCE

Compiled by Isabel M. Stewart, R.N.,
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I. PERSONAL HYGIENE AND PUBLIC HEALTH

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Bulletin 30 of Committee of One Hundred on National Health. Report on National Vitality. Its Waste and Conservation.....Irving Fisher.
Care of the Body.....Francis Cavanagh.
Civics and Health.....Wm. H. Allen.
Cost of Cleanness.....E. H. Richards.
Four Epochs of a Woman's Life.....A. M. Galbraith.
Health, Strength and Happiness.....C. W. Saleeby.
Hygiene and Physical Culture for Women.....A. M. Galbraith.
Industrial and Personal Hygiene....Geo. M. Kober.
Personal Hygiene.....W. L. Pyle.
Principles of Hygiene.....D. H. Bergey.
Rural Hygiene.....H. N. Ogden.
Sources and Modes of Infection.....C. V. Chapin.
The House Fly—Disease Carrier....L. O. Howard.
The Human Body (Briefer Course)..H. N. Martin.

II. HOUSEKEEPING AND HOME SANITATION

Bacteria Yeasts and Moulds in the Home.....H. W. Conn.
Care of the House.....Clark.

Home Economics.....Maria Parloa.
Home Sanitation.....E. H. Richards.
Household Hygiene. Household Bacteriology.....Marie Elliot.
Household Management.....Bertha Terrill.
Housekeeping Notes. Handbook of Home Economics.....M. Kittridge.
Laundry Manual.....Balderston & Limerick.

III. CHOICE AND PREPARATION OF FOOD FOR THE SICK AND WELL

First Lessons in Food and Diet.....Ellen H. Richards.
Foods and Cookery for the Sick and Convalescent.....F. M. Farmer.
Home Science Cook Book.....Lincoln and Barrows.
Lessons in the Proper Feeding of the Family.....W. S. Gibbs.

IV. CARE OF CHILDREN

Care of the Baby.....J. P. C. Griffiths.
Care and Feeding of Children.....Emmett Holt.
Health Care of the Baby.....L. Fischer.
Practical Motherhood.....Helen Campbell.
Short Talks with Young Mothers....Kerley.
Hygiene of the Nursery.....Etan

V. HOME NURSING

Home Care of the Sick.....Amy Pope.
Notes on Nursing.....Florence Nightingale.
Notes on Nursing for the Laboring Classes.....Florence Nightingale.

VI. PREVENTION AND TREATMENT OF DISEASE

Home Hygiene.....Norman Dirman.
Influence of Mind on the Body.....Dubois.
Mind and Work.....L. Gulick.
Nostrums & Quackery.....American Medical Association.

Self-help and How to Secure it.....Dubois.
The Conquest of Consumption.....Woods Hutchinson.
The Education of Self.....Dubois.
The Efficient Life.....L. Gulick.
Self-help for Nervous Women.....J. K. Mitchell.
Studies in Invalid Occupation.....Susan E. Tracy.
Tuberculosis a Disease of the Masses and How to Combat it.....Knopf.

VII. EMERGENCIES AND FIRST AID

American Red Cross Text Book of First Aid.....Lynch.
Immediate Care of the Injured.....Morrow.
Prompt Aid to the Injured.....Doty.

VIII. PAMPHLETS FOR REFERENCE AND FREE DISTRIBUTION

Publications of the United States Public Health Service

[Those marked (*) are exhausted and no longer available for free distribution. Those marked (†) may be purchased from the Superintendent of Documents.]

*24. How to Trap Rats. By W. C. Rucker. Reprint from P. H. R. No. 9, Vol. XXIII, February 28, 1908. 4 pages. Paper. Out of print.

†27. The Danger and Prevention of Tetanus from Fourth of July Wounds. By John F. Anderson. Reprint from P. H. R. No. 25, Vol. XXIII, June 19, 1908. 4 pages. Paper.

28. Prevention and Destruction of Mosquitos. By Joseph Goldberger. Reprint from P. H. R. No. 29, Vol. XXIII, July 17, 1908. 11 pages. Paper. (3d edition.)

30. The Rat and its Relation to the Public Health. By various authors. 1910. 254 pages. 60 figures. 6 plates. Paper. 50 cents.

1. Introduction. By Walter Wyman.
2. Natural History of the Rat. By D. E. Lantz.
3. Plague Infection in Rats. By G. W. McCoy.
4. Rat Leprosy. By W. R. Brinckerhoff.
5. Bacterial Diseases of the Rat other than Plague. By D. H. Currie.
6. Organic Diseases of the Rat. By G. W. McCoy.
7. Ecto Parasites of the Rat. By N. Banko.
8. Intestinal Parasites of Rats and Mice in their Relation to Diseases of Man. By C. W. Stiles.
9. Rodents in Relation to the Transmission of Bubonic Plague. By Rupert Blue.
10. Rodent Extermination. Rats and Mice. By W. C. Rucker.
11. Natural Enemies of Rats. By D. E. Lantz.
12. Rat-Proofing as an Antiplague Measure. By R. H. Creel.
13. Inefficiency of Bacterial Viruses in the Extermination of Rats. By M. J. Rosenau.
14. Plague Eradication in Cities by Sectional Extermination of Rats and General Rat-Proofing. By Victor G. Heiser.
15. The Rat in Relation to Shipping. By W. C. Hodby.
16. The Rat as an Economic Factor. By D. E. Lantz.
17. The Rat in Relation to International Sanitation. By J. W. Kerr.

†42. Soil Pollution and its Relation to Hookworm Disease and Typhoid Fever. By Ch. Wardell Stiles. Reprint from P. H. R., Vol. XXIV, No. 40, October 1, 1909. 10 pages. 3 illustrations. Paper.

†43. The Prophylaxis of Pellagra. By C. H. Lavinder. Reprint from P. H. R., Vol. XXIV, No. 44, October 29, 1909. 13 pages. Paper.

46. What the Local Health Officer Can Do in the Prevention of Typhoid Fever. By L. L. Lumsden. Reprint from P. H. R., Vol. XXV, No. 5, February 4, 1910. 14 pages. Paper. (Second edition.)

48. What the Mayor and City Council Can Do in the Prevention of Typhoid Fever. By L. L. Lumsden. Reprint from P. H. R., Vol. XXV, No. 24, June 17, 1910. 14 pages. Paper. (Second edition.)

*58. The Typhoid Bacillus Carrier: A Review. By R. M. Grimm. Reprint from the P. H. R., Vol. XXVI. No. 11, March 17, 1911. 17 pages. Paper.

†76. The Necessity for Safe Water Supplies in the Control of Typhoid Fever. By A. J. McLaughlin. Reprint from P. H. R., Vol. XXVII, No. 12, March 22, 1912. 13 pages. 5 tables. Paper. (Second edition.)

77. Sewage-Polluted Water Supplies in Relation to Infant Mortality. By Allan J. McLaughlin. Reprint from P. H. R., Vol. XXVII, No. 17, April 26, 1912. 36 pages. 24 charts. Paper.

78. Report of the Commission on Milk Standards Appointed by the New York Milk Committee. Reprint from P. H. R., Vol. XXVII, No. 19, May 10, 1912. 30 pages. 2 charts. Paper.

81. Sanitary Advice for Summer Tourists. Sanitary Advice for the Keepers of Summer Resorts. By W. C. Rucker. Reprint from P. H. R., Vol. XXVII, No. 21, May 24, 1912. Paper.

100. Whooping Cough—Its Nature and Prevention. A Popular Discussion of a Widespread and Dangerous Disease for which Familiarity has Bred Contempt. By W. C. Rucker. Reprint from the P. H. R., Vol. XXVII, No. 45, November 8, 1912.

*102. The Bedbug. By W. C. Rucker. Reprint from the P. H. R., Vol. XXVII, No. 46, November 15, 1912.

105. Antimalarial Measures for Farmhouses and Plantations. By Henry R. Carter. Reprint from P. H. R., Vol. XXVII, No. 49, December 6, 1912.

115. Hospital Relief for Rural Districts. The Possibilities Offered by Hospital Trains in Furnishing Much Needed Medical and Surgical Facilities to Those Living at a Distance from Cities and Towns. By Ch. Wardell Stiles. Reprint from the P. H. R., Vol. XXVIII, No. 5, January 31, 1913.

116. Country Schools and Rural Sanitation. Six Sample Public Schools in one County. Does this County Need Medical Inspection in its Schools? The Country School Teacher. By Ch. Wardell Stiles. Reprint from the P. H. R., Vol. XXVIII, No. 6, February 7, 1913.

117. A New Method of Grading Milk and Cream. By W. C. Woodward. Reprint from the P. H. R., Vol. XXVIII, No. 8, February 21, 1913.

131. Sanitation of Flood-Stricken Towns and Cities. With Special Reference to Conditions Observed in River Towns and Cities of Kentucky. By L. L. Lumsden. Reprint from P. H. R., Vol. XXVIII, No. 24, June 13, 1913.

Supplements to the Public Health Reports

[Those marked (*) are exhausted and no longer available for distribution. Those marked (†) may be purchased from the Superintendent of Documents at 5 cents a copy.]

1. Measles. By W. C. Rucker. Paper. 8 pages.
2. Indoor Tropics. The Injurious Effect of Overheated Dwellings, Schools, etc. By J. M. Eager. Paper. 8 pages.
3. Tuberculosis: Its Predisposing Causes. By F. C. Smith. Paper. 7 pages.

4. The Citizen and the Public Health. By A. M. Stimson. Paper. 12 Pages.
5. Fighting Trim: The Importance of Right Living. By J. M. Eager. Paper. 7 pages.
6. Contagious Diseases: Their Prevention and Control in Children's Institutions. By James P. Leake. Paper. 7 pages.

Bulletin 13, published by the Division of Chemistry, U. S. Dept. of Agriculture on Foods and Food Adulterants by H. W. Wiley.

Bulletins of the Department of Agriculture, Washington, D. C. (Free) Numbers 31, 85, 93, 101, 121, 126, 141, 142, 143, 156, 162, 166, 193, 203, 256, 270, 298, 332, 429, 431, 439, 444, 450 and others all dealing with food values and the preparation of common foods.

Bulletins of the Bureau of Entomology, U. S. Dept. of Agriculture. Washington, D. C. Circulars 36, 46, 47, 48, 50, 51, 71, 108, dealing with housepests and their extermination (Free).

Technical Education Bulletins, No. 3. Feeding of Young Children, No. 5. Quantitative Aspects of Nutrition, 10 cts. each. Published by Teachers College, Columbia University, N. Y. City.

Cornell Reading Course for Farmers Wives. N. Y. State College of Agriculture (free for residents of N. Y. State)—Series on Sanitation, Food and Nutrition. Farm House Series 2, 3, 4 and 5.

Pamphlets published by the Housekeeping Experiment Station 28 Hoyt St., Stamford, Conn., dealing with housekeeping equipment, methods, etc.

Health Education Series—Published by the Health Education League, 113 Devonshire St., Boston, Mass., 2 cts.

to 8 cts. each or $1.50 to $5.00 per 100. Sample free. (Small booklets dealing with milk, meat, drink, healthful homes, care of children, sexual hygiene, tuberculosis, etc.)

Educational Pamphlets on Sex Hygiene, published by The American Society of Sanitary and Moral Prophylaxis, 9 E. 42nd St., N. Y. Prices 10 cts.–25 cts.

Leaflets on Sex Hygiene published by the Mass. Assoc. of Boards of Health.

Pamphlets published by the Committee on Prevention, of the Association for the Blind, N. Y. City, 105 E. 22nd St., N. Y. City.

Pamphlets published by the National Association for the Study and Prevention of Tuberculosis, 105 E. 22nd St., N. Y.

Handbook of Help for persons suffering from pulmonary tuberculosis. Published by the Department of Health, N. Y.

Leaflets published by State Charities Aid Association, 105 E. 22nd St., N. Y. City, on the prevention of insanity and nervous diseases.

Pamphlets in English, Hebrew and German published by Department of Public Health, Pittsburgh, Pa., on the care of Babies in Hot Weather. (Similar pamphlets published by Boards of Health in New York and many other cities.)

We are indebted to the Department of Health, City of New York, for permission to use the following circulars of information issued by the Division of Child Hygiene.

DEPARTMENT OF HEALTH
THE CITY OF NEW YORK

Instructions to Parents Regarding the Care of the Mouth and Teeth

The physical examination of school children shows that in many instances the teeth are in a decayed and unhealthy condition.

Decayed teeth cause an unclean mouth. Toothache and disease of the gums may result.

Neglect of the first teeth is a frequent cause of decay of the second teeth.

If a child has decayed teeth, it cannot properly chew its food. Improperly chewed food and an unclean mouth cause bad digestion, and consequently poor general health.

If a child is not in good health, it cannot keep up with its studies in school. It is more likely to contract any contagious disease, and it has not the proper chance to grow into a robust, healthy adult.

If the child's teeth are decayed, it should be taken to a dentist at once.

The teeth should be brushed after each meal, using a tooth brush and tooth powder.

The following tooth powder is recommended:

2 oz. powdered precipitated chalk.
½ oz. powdered Castile soap.
1 dram powdered orris root.
Thoroughly mix.

This prescription can be filled by any druggist at a cost not to exceed fifteen cents.

DEPARTMENT OF HEALTH

CITY OF NEW YORK

Instructions to Parents Regarding the Care of the Nose

The physical examination of school children shows that in many instances they breathe through the mouth because they cannot breathe properly or sufficiently through the nose.

This may be due to bad habits in regard to keeping the nose clean, or, in a majority of instances, to a growth which is known as "adenoids" and which stops up the back of the nose. In either case, the air is not breathed through the nose, and the child becomes what is known as a "mouth breather."

Constant breathing through the mouth causes the child to become pale, restless in its sleep and dull in its actions. The child often speaks as though it had a cold in the head. Frequently there is an almost constant discharge from the nose.

Mouth breathing renders a child especially liable to contract tuberculosis and other infectious diseases; in fact, the child has very little resistance to disease of any kind.

Every child should be given a handkerchief, and be taught to thoroughly blow the nose several times each day. If, after doing this regularly, the child is still unable to breathe properly through the nose, it is probable that an adenoid growth is present. Such children should be taken to the family physician or to a dispensary for further advice and treatment.

Do not wait too long in the hope that the child will outgrow the condition, for the effect of adenoid growths persisting throughout childhood may injure the person for life.

Have your child's throat and nose examined one month after measles, scarlet fever, or diphtheria.

DEPARTMENT OF HEALTH
CITY OF NEW YORK

Instructions to Parents on the Care of Children's Hair and Scalp

Children affected with vermin of the head are excluded from school. The following directions will cure the condition:

Mix one-half pint of sweet oil and one-half pint of kerosene oil. Shake the mixture well and saturate the hair with the mixture. Then wrap the head in a large bath towel or rubber cap so that the head is entirely covered; the head must remain covered from six to eight hours.

(Tincture of larkspur may be used instead of oil mixture. The directions for use are the same.)

After removing the towel, the head should be shampooed as follows:

To two quarts of warm water add one teaspoonful of sodium carbonate (washing soda). Wet the hair with this solution and then apply Castile soap and rub the head thoroughly about ten minutes. Wash the soap out of the hair with repeated washings of clear warm water. Dry the hair thoroughly.

Nits: If the head is shampooed regularly each week as above described, it will cure and prevent the condition of "nits."

DEPARTMENT OF HEALTH
CITY OF NEW YORK

DIET FOR CHILD FROM 12TH TO 18TH MONTH

First Meal—on Rising.

(1) 1 to 2 ounces juice of a sweet orange
or
Pulp of 6 stewed prunes
or
1 ounce pineapple juice.

(2) 8 ounces milk with either zwieback, or toasted biscuits or stale toasted bread.

Note: Fruit must be given either ½ hour before or ½ hour after milk.

Second Meal—During Forenoon.

Milk alone or with zwieback.

Noon Meal.

(1) 6 ounces soup
or
3 ounces beef juice.

Note: Soup may be made of chicken, beef or mutton.

(2) Stale bread may be added to the above.

Fourth Meal—Afternoon.

Milk or toasted bread and milk.

Evening Meal.

(1) 4 ounces thick gruel mixed with 4 ounces top half milk. Taken with zwieback.

Note: Gruel may be made of oatmeal, farina, barley, hominy, wheatena, or rice.

(2) Apple sauce
or
Prune jelly.

Total milk in 24 hours, 1 to 1¼ quarts.

Note: 8 ounces is equal to a half pint.

DEPARTMENT OF HEALTH

CITY OF NEW YORK

DIET FOR CHILD FROM 18TH TO 24TH MONTH

Breakfast.

(1) Juice of one sweet orange
or
Pulp of six stewed prunes
or
Pineapple juice (fresh or bottled) 1 ounce.

(2) A cereal such as cream of wheat, oatmeal, farina, or hominy preparations with top milk (top 16 ounces) sweetened or salted. A glass of milk, bread and butter.

Note: If constipated give the fruit ½ hour before breakfast with water; if not, they may be given during the forenoon.

Raw fruit juice must be given either ½ hour before or ½ hour after milk.

Forenoon.

A glass of milk with two toasted biscuits or zwieback or graham crackers.

Dinner.

(1) Broth or soup made of beef, mutton, or chicken, and thickened with peas, farina, sago or rice
or
Beef juice with stale bread crumbs; or clear vegetable soup with yolk of egg
or
Egg soft boiled, with bread crumbs, or the egg poached, with a glass of milk.

(2) Dessert: apple sauce, prune pulp, with stale lady-fingers or graham wafers
or
Plain puddings: rice, bread, tapioca, blanc-mange, junket or baked custard.

Supper.

Glass of milk, warm or cold; zwieback and custard or stewed fruit.

Total milk in 24 hours, 1½ quarts.

DEPARTMENT OF HEALTH

CITY OF NEW YORK

DIET FOR CHILD FROM TWO TO THREE YEARS

Breakfast.

(1) Juice of 1 sweet orange
or
Pulp of 6 stewed prunes
or
1 ounce pineapple juice (fresh or bottled)
or
Apple sauce.

(2) A cereal such as oatmeal, farina, cream of wheat, hominy or rice, slightly sweetened or salted as preferred, with the addition of top milk (top 16 ounces)
or
A soft boiled or poached egg with stale bread or toast.

(3) A glass of milk.

Note: If constipated give the fruit ½ hour before breakfast with water; if not, they may be given during the forenoon.

Milk and raw fruit juice must not be given at same meal.

Dinner.

(1) Broth or soup made of chicken, mutton or beef, thickened with arrowroot, split peas, rice, or with addition of the yolk of an egg or toast squares.

(2) Scraped beef or white meat of chicken, or broiled fish (small amount)
or
Mashed or baked potatoes with fresh peas or spinach or carrots.

(3) Dessert: apple sauce, baked apple, rice pudding, junket or custard.

Supper.

(1) A cereal or egg (if egg is not taken with breakfast) with stale bread or toast
or
Bread and milk or bread and cocoa or bread and custard.

(2) Stewed fruit.

DEPARTMENT OF HEALTH
CITY OF NEW YORK

DIET FOR CHILD FROM THREE TO SIX YEARS

BREAKFAST.

(1) Fruits: an orange, apple, pear or stewed prunes.
(2) Cereal: oatmeal, hominy, rice or wheat preparations, well cooked and salted, with thin cream and sugar

or

Egg: soft boiled, poached, omelet or scrambled.
(3) Milk or cocoa.

DINNER.

(1) Soup: beef, chicken or mutton.
(2) Meat: chicken or beefsteak or roast beef or lamb chops or fish.
(3) Vegetables: spinach or carrots or string beans, peas, cauliflower tops, mashed or baked potatoes, beets or lettuce (without vinegar)
Macaroni, spaghetti.
Bread and butter—not fresh bread or rolls.
(4) Dessert: custard, rice or bread or tapioca pudding, ice cream (once a week) cornstarch pudding (chocolate or other flavor) stewed prunes or baked apple.

SUPPER.

(1) Milk toast or graham crackers and milk

or

A thick soup, as pea, or cream of celery with bread and butter

or

A cereal and thin cream with bread and butter.
(2) Stewed fruit; custard or plain pudding; jam or jelly.

SCHOOL LUNCHEONS SERVED IN NEW YORK CITY

ARTICLES 1c. EACH

MONDAY	Macaroni and tomato soup Jam sandwich Fruit—Cake
TUESDAY	Lentil soup Egg and onion sandwich Fruit—Cake
WEDNESDAY	Potato soup Bologna sandwich Salad—vegetable Fruit—Cake
THURSDAY	Beans and potato soup Meat sandwich Fruit—Cake Rice pudding
FRIDAY	Peas and rice soup Salad sandwich Fruit—Cake Bread

MONDAY	Macaroni and tomato soup Sandwiches Apple sauce (Bananas & apples)	Bread Fruit	Cocoa Crackers
TUESDAY	Vegetable soup Sandwiches Cakes	Bread Fruit	Cocoa Crackers
WEDNESDAY	Bean soup Sandwiches Fruit	Bread Pudding	Cocoa Crackers
THURSDAY	Rice soup Sandwiches Fruit	Bread Cakes	Cocoa Crackers
FRIDAY	Corn chowder Sandwiches Crackers	Bread Fruit	Cocoa Crackers

LEAFLET ISSUED BY THE HEALTH DEPARTMENT OF PROVIDENCE, RHODE ISLAND, FOR DISTRIBUTION AMONG SCHOOL CHILDREN

REMEMBER

Do not spit if you can help it. Never spit on a slate, floor, or sidewalk.

Do not put the fingers into the mouth.

Do not pick the nose or wipe the nose on the hand or sleeve.

Do not wet the finger in the mouth when turning the leaves of books.

Do not put pencils into the mouth or wet them with the lips.

Do not put money, string, pins or tickets into the mouth.

Never drink from a glass or cup that is used by others.

Do not put anything into the mouth except food and drink.

Do not swap apple cores, candy, chewing gum, half-eaten food, whistles or bean-blowers or anything that is put in the mouth.

Never cough or sneeze in a person's face; turn your face to one side.

Keep your face and hands clean; wash the hands with soap and water before each meal.

LEAFLETS ISSUED IN OHIO AFTER FLOODS OF MARCH, 1913

WARNING

Dayton, Ohio, March 29, 1913.

THE STATE BOARD OF HEALTH hereby orders:

1. All drinking water must be boiled and kept in a boiled container until further notice.

2. Scrub hands carefully with soap and water before conveying any food whatever to the mouth.

3. Eat preferably only thoroughly cooked foods, including approved canned goods.

4. Kill all flies.

5. Boil all food receptacles and utensils.

6. If uncooked vegetables, such as onions, radishes, etc., are eaten, they should be first washed carefully with boiled water.

7. Upon the appearance of any suspicious signs of illness whatever, report to a competent physician at once.

Ohio State Board of Health
E. F. McCampbell, Secretary

Sanitary Caution!

GARBAGE—Burn garbage in stoves or furnaces, or bury it until the collection service is organized. If garbage accumulation is too great to be disposed of by burning or burying it, notify your District Sanitary Officer and arrangements will be made for its removal.

HOUSECLEANING—All houses in the flooded section, including cellars and premises, must be cleaned without delay. Householders and owners of property shirking this duty are subject to arrest.

PLUMBING—Defects in house connections with sewers, breaks in water pipes, and gas leaks should be attended to at once by securing the services of a plumber. The telephone book will give you the addresses of available plumbers.

SEWAGE—If you were dependent on a privy that has been destroyed, use a receptacle in the house, cover the discharges with a disinfectant and empty the contents through a manhole in the street into the sewer, until a new temporary privy can be constructed, digging a new vault if necessary. Comfort Stations have been provided over sewers throughout the flooded section. Don't soil the ground! Property owners are directed to comply with the city ordinance requiring house connection with the sanitary sewer without delay.

WATER—Continue to use boiled water or bottled water for the present. Tap water is not yet safe for drinking purposes.

SICKNESS—Report all cases of sickness at once to your doctor; it may be the means of preventing a spread of disease in your family and among your neighbors.

HOW TO USE DISINFECTANTS

For washing floors and walls—
Cresol or other carbolic acid preparations, using one part of disinfectant to twenty parts of water.

For treating privy vaults, commodes, cellars and putrefying material—
Chloride of lime, using one pound of disinfectant to five gallons of water, or use ordinary lime, spreading it freely.
For yards and barns spread lime about freely.
Whitewash your cellars.

For purifying ice chests and closed receptacles of all kinds for meats—
Formaldehyde standard solution, one part of disinfectant to twenty parts of water.
Large ice chests should be fumigated; apply to Board of Health.

Thomas L. Rhoads,
Major, Medical Corps, U. S. Army,
Chief Sanitary Officer.

Dayton, Ohio, April 12, 1913.

RECIPES FOR FOOD AND BEVERAGES MOST COMMONLY USED FOR INVALIDS

Sterilized or Pasteurized Milk

Put the milk into clean glass bottles with small necks, and stop with a pledget of absorbent cotton. Place in a wire frame or basket and immerse in a kettle of cold water heating it gradually to 170° F. Keep at this temperature for one hour, cool quickly and place on ice. Do not remove cotton until ready to use.

Peptonized Milk

Cold Process

1 cup of milk

¼ cup of cold water

½ tubeful of Fairchild's peptonizing powder.

Mix the powder and water by shaking in a glass jar or bottle, add the milk, shake again, cover and place on ice until needed.

Warm Process

Same as above but when mixed place jar in warm water temperature about 115° F., and let stand 15 or 20 minutes or until the milk tastes slightly bitter. Place on ice or serve at once.

Albuminized Milk

1 cup of milk

1 egg (white only)

Salt to taste

Shake well in covered glass jar, strain and serve at once.

Junket

1 cup of milk

Sweeten to taste

Flavor with coffee, sherry or nutmeg, warm slightly and add

½ junket tablet.

Cover and leave in a warm room until set, then place on the ice, serve cold.

Milk Punch

1 cup of cold milk

1 tablespoonful of rum or brandy

1 tablespoonful of sugar

Shake until foamy and serve at once.

Egg Nog

½ cup milk

1 egg

1 tablespoonful of wine or brandy

Sugar and salt to taste

Beat the egg lightly add sugar and salt, then milk and wine, mix thoroughly strain and serve.

Wine Whey

1 cup of sweet milk

½ cup sherry wine

Heat the milk almost to the boiling point, add sherry and keep hot until the curd forms, strain and serve either hot or cold.

Lemon Whey

Same as above substituting 2 tablespoonfuls of lemon juice for wine.

Barley Water

1 tablespoonful of barley flour

Dissolve in cold water and add to

1 quart of boiling water.

Cook in double boiler 45 minutes add enough boiling water to make one quart, strain, cool and keep on the ice.

If used for adults lemon juice and sugar to taste may be added.

Rice Water

2 tablespoonfuls of rice
1 quart of cold water

Wash rice and add to cold water, cook 2 hours, add enough boiling water to make a quart, strain and serve hot or cold.

Rice Milk

Same as above using milk instead of water, season to taste, may be served without straining.

Cracker Gruel

2 tablespoonfuls of cracker crumbs
1 scant teaspoonful of sugar
1 cup boiling water
1 cup hot milk
Salt to taste

Mix together and simmer gently for 2 minutes, serve hot without straining.

Indian Meal Gruel

1 tablespoonful Indian meal
1 quart boiling water
Salt to taste

Mix meal with a little cold water, stir into hot water and cook in double boiler 2 hours. Add water or milk to make 1 quart, strain and serve hot or cold.

Flour Gruel

1 cup of milk
½ tablespoonful of flour
Salt to taste

Mix flour in a little cold milk add to hot milk and cook in double boiler for ½ hour. Cooked raisins or sugar and flavoring may be added if desired.

Arrow Root Gruel

2 teaspoonfuls of arrow root
2 tablespoonfuls cold water
½ pint of boiling water or milk
Salt to taste

Mix the arrow root with the cold water, add to boiling water and cook 2 hours in double boiler. Sugar and any desired flavoring may be added, serve hot or dilute with milk and serve cold.

Oat Meal Gruel

2 tablespoonfuls of oatmeal
1 cup of boiling water

Cook 2 hours in double boiler, strain through wire strainer, add 1 cup milk and bring to boiling point—serve hot.

Dry Toast

Use stale bread and cut in thin slices, dry in oven and brown over the fire. Toast for invalid should be crisp to the center of the slice.

Milk Toast

2 slices of bread toasted as above, butter if desired
1 cup of milk

Bring almost to the boiling point, season with salt, pour over the toast and serve at once.

Cream Toast

Use a thin white sauce instead of hot milk, made as follows:

2 cups of milk
1 tablespoonful butter

1 tablespoonful flour
Salt to taste

Stir carefully until mooth and cook 10 minutes. Strain if necessary.

Soft Cooked Eggs—in the Shell

Use about one pint of boiling water for each egg.

Pour over the eggs and let them stand near the fire for 10 minutes, but do not boil. The egg if properly cooked will be the consistency of jelly.

Hard Boiled Eggs

Place in boiling water and keep just below the boiling point for ½ hour.

Poached Eggs

Break eggs in a small dish and slip gently into a shallow pan nearly full of boiling water slightly salted, simmer slowly until the egg is firm enough to lift without breaking—serve on piece of buttered toast.

Foamy Omelet

Separate the yolks from the whites of two eggs, and put them into bowls. To the yolks add a salt spoon of salt and one-fourth of a saltspoon of pepper. Beat with a Dover egg-beater until light. Then add two tablespoons of milk. Beat the whites until stiff, but not as stiff as possible, and fold, not beat them into the yolks, so that the whole shall be very light and puffy. Pour the mixture into a buttered omelet pan, and cook slowly until the under side begins to change color and become brown, or for about two minutes. Then put the pan on the grate in the oven for about one minute, to cook the upper surface. One must endeavor to avoid both over and under cooking. If the omelet is not done enough, the raw egg will ooze out after it is folded; on

the other hand, if it is cooked too much it will be dry and tough. When it seems to be coagulated on the upper surface, run a case-knife under it to separate it from the pan, and fold one-half over the other. Take the platter which is to receive it in the right hand, lay it against the edge of the pan, and tip the omelet out. Serve immediately. (Boand.)

Beef, Mutton or Chicken Broth

1 pound meat to each quart of cold water

Wash meat in cold water or wipe with a wet cloth, cut the meat in small pieces and break the bones. Remove all fat and membranes leaving only the clear meat and bones. Simmer for three hours, season to taste, strain through a coarse strainer, remove fat when cold—serve hot as needed.

Mock Bisque Soup

1 pint tomatoes
1 quart milk
¼ cup butter
1½ tablespoonfuls corn-starch or flour
¼ tablespoonful soda
Pepper and salt to taste

Steam tomatoes until soft enough to strain juice. Heat milk in a double boiler. Heat butter and add corn-starch with it. Pour on enough milk to prepare a thickening, add to the rest of the milk and boil for 10 minutes or more, stirring carefully. To the strained tomatoes add the soda to prevent the acid from curdling the milk. When the gases pass off, add the tomatoes to the milk, season and serve immediately with croutons or crackers. (Pattee.)

Cream of Celery Soup

½ cup celery
1 cup boiling water
1 tablespoonful butter
1 tablespoonful flour
½ cup cream
½ cup milk
⅛ tablespoonful onion juice
Pepper and salt to taste

Wash and scrape the celery and cut it into ½ inch pieces; then cook it in the water until very soft. Renew the water as it boils away. Mash the celery in the water in which it was cooked. Cook the onion, milk and cream together in a double boiler and add it to the celery. Rub the mixture through a strainer and heat it in the double boiler. Melt the butter add the flour and add gradually the celery stock and milk. Salt and pepper to taste. Serve hot. (Pattee.)

Scraped Beef

½ pound of round steak cut one inch thick

Place on a clean board and scrape with a dull knife removing only the pulp. Season this pulp with salt and make into small flat cakes, broil over the fire or in a hot pan not more than 2 minutes and serve at once on dry toast.

Scraped Beef Sandwiches

Prepare meat pulp as above.

Season the uncooked pulp to taste and spread between thin slices of stale bread—serve without butter.

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